

WORK EDUCATION IN SCHOOLS

CBSE



**CENTRAL BOARD OF SECONDARY EDUCATION
PREET VIHAR , DELHI - 110092**

CBSE Delhi -110092

March 2004

No. of Copies : 5000

PRICE :

NOTE : The Board reserves the right to amend Syllabi and Courses as and when it deems necessary.

Published by G. Balasubramanian, Secretary
C.B.S.E., 2, Community Centre, Preet Vihar, Delhi – 110092

Printed at

Designed by : Chopra & Associates
J-4/1, Rajouri Garden, New Delhi-110027. Ph.: 25933672, 25439330

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WORK EDUCATION

A Perspective

Our education has got to be revolutionized. The brain must be educated through the hand. If I were a poet, I would write poetry on the possibilities of five fingers. Those who do not train their hands, who go through the ordinary rut of education, lack MUSIC in their life.

- Mahatma Gandhi

UNIT I

WORK EDUCATION – Definition, Historical Perspective, Concept and Objectives

Definition of Work Education :-

Work Education is viewed as purposive and meaningful manual work, organized as integral part of the learning process and resulting into goods or services useful to the community, besides the pleasure of self-fulfillment. It should be an essential component at all stages of education and must be provided through a well-structured and graded programme. The competencies to be developed in this field should include knowledge, understanding skills and values through need-based life activities.

Major categories of work, which need to be specifically stressed include:

- a) Work pertaining to the needs of individual, such as health, hygiene, clothing, cleanliness, etc;
- b) Work at home to be performed as a member of the family;
- c) Work in the classroom, school and in the out of school activities integrated with school life;
- d) Work as a learning experience through other subjects such as physical education, art education, social studies, science and others;
- e) Work in the community focused on selfless service;
- f) Work relating to vocational development, production, social usefulness and exploration of the opportunities and care pathways.

Historical Perspective

Over the past fifty years in our country and especially in the last twenty years or so, there has been an increasing appreciation of the need to include work as a vital component at all stages of school education. This has its roots in the perceptions about work education as a powerful means of restoring respect and dignity to all types of manual work, removing distinctions between manual workers and white collar workers, promoting self-reliance in meeting one's daily needs and those of the society, increasing productivity through the development of proper work skills and values, and accelerating the process of economic development in the country through community service and social work by students.

More specifically, Work Education provides the basis for building up proper attitudes towards work developing favourable work values and habits, imparting necessary knowledge related to work, and developing appropriate work skills, which can help the children to become productive and self-reliant in meeting their day-to-day needs and those of their families and communities. Work Education can further enable the children to discover their real interests and aptitudes which would be helpful to them in selecting suitable courses of study and occupations later on. Since work occupies a prominent position in the life and well-being of an individual and a country, Work Education should have a pride of place in the school curriculum as a means of achieving self-reliance and as a preparation for adult life.

In view of the unique importance of work education for the all round development of the child and well-being of the country, considerable importance has been given to it in almost all important schemes, reports and documents on education which have come out in the last fifty years e.g. Gandhiji's Scheme of Basic Education, Kothari Commission's Report, NCERT's Ten-Year School Curriculum, Report of the Ishwar Bhai Patel Committee, the National Policy of Education, 1986 and more recently the National Curriculum Framework 2000. Consequently, work education has come to be viewed as an important link between education and productivity, as an important instrument for the preparation of the child as a self-supporting and productive citizen and as a potent means of social reconstruction and national development. It has been introduced and implemented under different names, such as Craft Education (1937), Work Experience (1967), Socially Useful Productive Work (1977), at different times and in different parts of the country.

The National Policy on Education (NPE) has assigned a very important place to work education in the school curriculum at all stages. It has reverted to the term "Work Experience" which was earlier used by Kothari Commission for work education. The NPE states: "Work Experience, viewed as purposive, meaningful, manual work, organized as an integral part of the learning process and resulting in either goods or services useful to the community, is considered as an essential component (of curriculum) at all stages. It is to be provided through well-structured and graded programmes. Work Experience would comprise activities in accordance with the interests, abilities and needs of students, the level of skills and knowledge to be upgraded with the stages of education. This experience would be helpful to a student on his entry into the work force. Pre-vocational programmes provided at the

lower secondary stage will also facilitate the choice of vocational courses at the higher secondary stage.

Recently, the National Curriculum Framework for School Education developed by the NCERT (2000a) suggested a more comprehensive term “Work Education” in place of the earlier nomenclature of Work Experience.

Concept of Work Education

The National Policy on Education 1986 has conceived Work Education as purposive and meaningful manual work that results in goods or services which are useful to the society. Work Education comprises activities consisting of services, goods and community development in various areas of human needs such as health and hygiene, food, clothing, recreation and social service in accordance with mental abilities and manual skills of children at various stages of education and the availability of local resources. The Policy visualized intensive participation in production and service-oriented projects for the middle and lower-secondary stages along with an “Earn while you learn” dimension for needy students on an optional basis. It assigned equal importance to community work/social service for creating social awareness and concern for the welfare/development of the local community or society at large.

The essential attribute of Work Education is, therefore, its manual character which means that the children are to work with their hands and thereby develop a purposive or educative in that it should help develop knowledge, understanding attitudes, personal-social qualities and skills related to the world of work. Further, Work Education should be meaningful i.e., it should help in the satisfaction of children’s basic needs of life such as food, clothing, shelter, health, hygiene and recreation, through production of goods or rendering of services. Social or community service for the welfare/development of the community or society at large should also form an essential component of Work Education.

Work Education in the National Policy on Education (NPE)

Work Education in the NPE is thus conceptually the same as SUPW. However, its emphasis is on well-structured and graded programmes at all stages of school education including programme at the middle school stage which would develop sufficient psychomotor skills and confidence among students for entering the world of work directly or through certain occupational courses. It also envisages pre-vocational programmes at

the lower secondary stage as preparation for direct entry into working life or choice of vocational courses at the higher secondary stage.

The most important goal of education is to prepare children for life as adults and to impart knowledge, skills, qualities and attitudes which make them self-supportive individuals and productive citizens. Pre-vocational programmes at the secondary and higher secondary (academic stream only) stages, as visualized in the NPE, are aimed specifically at development of skills in different work areas through well-designed courses so that those who stop studies after the high/higher secondary stages are able to enter the world of work directly or with a little more preparation. The emphasis in such courses is on practical work to satisfy the needs of students, school and community and to find the solution of problems. Saleability and commercial acceptability of the goods or services produced should be highlighted in pre-vocational courses to sensitize pupils to the production of quality goods. Pre-vocational courses in Work Education should be viewed as ground preparation for vocational for those who drop out after class X and as preparation for vocational courses for those who opt for them at the plus two stage.

The National Curriculum Frame Work for School Education (2000) has also emphasized concept and philosophy of Work Education and it stressed that the activities pertaining to work education should be so organized as to realize the objectives of Work Education such as inculcation among learners of respect for manual work, values for self-reliance, cooperativeness, perseverance, helpfulness, tolerance and work ethics besides developing attitudes and values-related to productive work and concern for the community. The theory and practice have to be such that it enables learners to understand the facts, terms concepts and scientific principles involved in various forms of work situations, know the sources of raw-materials, understand the use of tools and equipments in production and service processes, acquire skills needed for technologically advancing society and conceptualize their role in productive situations. The programme should develop among learners the skills for identifying, selecting, arranging and developing innovative methods and observing, manipulating and participating in work practices and thereby enhancing productive efficiency.

Objectives of Work Education

In order to give proper direction to Work Education activities, it is necessary to be clear about the objectives of Work Education. A list of the overall objectives of Work Education is given below:

A COGNITIVE DOMAIN (Knowledge and Understanding)

Work Education helps the pupil to

- i) Identify his needs and those of his family and community in respect of food, health and hygiene, clothing, shelter, recreation and social service.
- ii) Acquaint himself with productive activities in the community.
- iii) Know the sources of raw materials and understand the use of tools and equipment in the production of goods and services.
- iv) Understand scientific facts and principles involved in various forms of work.
- v) Understand the process of planning and organizing productive work.
- vi) Understand his role in productive situations.
- vii) Understand the needs of a technologically advancing society in terms of productive processes and skills.

B. PSYCHOMOTOR DOMAIN (Skills)

It helps the pupil to

- i) Develop skills for the selection, procurement, arrangement and use of tools and materials for different forms of productive work.
- ii) Develop skills for the application of problem solving methods in productive work and social service situations.
- iii) Develop skills for greater productive efficiency.
- iv) Use his creative faculties for devising innovative methods and materials.

C. AFFECTIVE DOMAIN (Attitude and Values)

It helps the pupil to

- (i) Develop respect for manual work and regard for manual workers.
- (ii) Inculcate socially desirable values such as self-reliance, helpfulness, cooperativeness, team-work, perseverance, tolerance, etc.
- (iii) Develop proper work habits and values such as regularity, punctuality, discipline, honesty, efficiency, love of excellence and dedication to duty.
- (iv) Develop self-esteem and confidence through achievements in productive work and services.
- (v) Develop a deeper concern for the environment and a sense of belonging, responsibility and commitment to the society.
- (vi) Develop awareness of socio-economic problems of society.
- (vii) Appreciate the utility of productive work and services to the community.

Unit II

Work Education- An Essential Curricular Area

The National Policy on Education has given a clear direction that work Education is viewed as purposive and meaningful manual work: organized as an integral part of the learning process and resulting in either goods or services useful to the community, should be considered as an essential component at all stages of education to be provided through well structured and graded programmes. The Policy also has laid down that it would comprise activities in accordance with the interests, abilities and needs of students, the level of skills and knowledge to be upgraded with the stages of education. It is expected that this experience would be helpful on his entry into the workforce. Pre-vocational programmes provided at the secondary stage are expected to facilitate the choice of vocational courses at the senior school stage.

Place in the Scheme of Studies

As such the Board has prescribed the following as compulsory learning areas at the Secondary stage with relative time allocations:

<u>Area</u>	<u>Periods per week</u>
Two languages	14
Mathematics	7
Science	9
Social Science	9
Work Education	2
	+ 2 (outside school hours)
Art Education	2
Physical and Health Education	2
Total	45

At the senior school stage, Work Education is again compulsory and its allocation of time vis-à-vis other subjects is given below:

<u>Area</u>	<u>Periods per week</u>
Two languages	14
Three Electives	24
General Studies	3
Work Education	2
	+2 (outside School hours)
Physical and Health Education	2
Total	<u>45</u>

Thus about 10% of the time is required to be spent on Work Education at the secondary and senior school stages. It is advised that schools may spend more time on work education in the lower classes going upto 15% of the total time, if possible.

The importance of work education must be clearly understood. Both in the schemes for Secondary School Examination (Class X) and Senior School Certificate Examination (Class XII), it is laid down that a candidate shall be eligible to get the pass certificate of the Board only if he gets a grade higher than "E" in Work Education as in other subjects on internal assessment unless he is exempted. If a candidate fails to get the requisite grade as certified by the school, the result of external examination will be withheld but not for a period of more than one year. It would, therefore be worthwhile if schools provide for similar importance to Work Education in their own promotion rules.

Nature of Learning Experiences

What is important for the successful implementation of Work Education is not just the allocation of time but an attempt on the part of schools to integrate it with the process of learning. At the primary stage, therefore, it should be properly integrated with environmental studies and its applications. It should also encourage experimentation with materials, tools and techniques and should familiarize the students with work practices.

At the middle, secondary and senior school stages, exposure to work experience should come through activities which fall under:

i. **Core Area** – under which students learn to look after their own needs and those of their neighborhood and community including the school through compulsory activities involving manual work and social service; and

ii. **Elective Area** – under which students through repeated practice in an activity of their choice acquire enough skills in productive work and services. This will also be in the nature of pre-vocational experience in some cases.

Criteria for Selection of Activities

In the pages that follow, number of illustrative activities both under the Core and Elective Areas are given for the guidance of schools. The list, obviously, cannot be exhaustive. The schools have the freedom to plan their own activities according to their own needs. While planning an activity the schools should ensure that it satisfies the following criteria:

1. The activity must be in accordance with the basic concept of Work Education involving purposive, meaningful and manual work;
2. It should help the students in developing desirable work ethics and social values;
3. It should be suited to the level of maturity of students;
4. It should generate enough interest among the students. One can take a horse to water but cannot make it drink. So students have not to be forced to undertake an activity with the result that their unwillingness becomes a stumbling block;
5. It should be easy to be organized by the, staff without much outside help and should have most of the schools resources; and
6. It should have most of the following dimensions:
 - i. Identification of a problem;
 - ii. Observation of work situation;
 - iii. Participation in a work situation or involvement in manual work;
 - iv. Cultivation of good habits and attitudes;
 - v. Production of goods/services.

UNIT III

Implementation Of Work Education

The content of Work Education will be based on the needs of the pupils on one hand and on the resources available in the community and the facilities available in the school on the other. Since these will differ from place to place, no fixed programme can be prescribed for all the school in the area, state or country. It is in keeping with this realization that suggestive syllabi in Core and Elective areas have been designed for Work Education programme for the schools affiliated with CBSE, so that it leaves less scope for varied conceptual interpretations.

Besides including Work Education activities of a wide variety for all upper primary, secondary and senior secondary stages which is not exhaustive, the suggestive list of activities under the elective area also includes pre-vocational courses as a part of the Work Education programme for the secondary school stage.

The Core Area covers the following nine aspects of human needs:

- i. Nutrition Education
- ii. Health Education
- iii. Population Education
- iv. Culture and Recreation
- v. Value Development
- vi. Media and Mass Communication
- vii. Information Technology
- viii. Consumer Education
- ix. Environment

The purpose of this area is to bring about attitudinal changes and to develop readiness for continued productive work. Therefore every pupil has to undertake at least 60 per cent of the activities in the syllabus under the Core area in each class.

The purpose of the Elective Areas is to give a vocational bias to the Work Education programme. It may therefore, require repetition or constant practices according to the time available. A school may select at least two elective activities depending on the availability of time, season,

human expertise, raw materials etc., but a student will undertake only one activity in a class. This is to facilitate provision of funds and make small groups for practical work. A student has to cover at least 50 per cent of the syllabus under the activity he selects in each class in this area to ensure minimum level of competence.

Work Education activities should not be performed mechanically, but must include planning, analysis and detailed preparation at every stage.

In the teaching-learning process, teachers may adopt problem-solving approach. Pupils should be made aware of the problems related to their needs and the work that should be undertaken to satisfy their needs. They should be led to arrive at the solution of these problems by discussing the materials, tools and techniques for performing work and services and by undertaking appropriate work.

If a school intends to introduce a work education activity for which the syllabus is not given here, the school may design its syllabus to satisfy the criteria listed earlier.

Since different activities have been suggested for different classes, the most appropriate method of organizing the time-table is to have Work Education period for all the sections of a class at the same time if the school has a large number of activities to offer and to have it section wise if there are only 2-3 activities for each class.

The Principal of the school will prepare a scheme of work for the year in the prescribed performa, which is subject to inspection by the Board authorities.

Students are expected to keep a record of the activities under Core and Elective Areas performed by them in a particular class in the prescribed performa. This record is subject to inspection by the teachers, the Principal and the higher authorities and will be submitted for evaluation at the annual promotion examination.

Teacher will do continuous comprehensive evaluation of the students and keep a record as given under each Elective Area, which is subject to inspection by the Principal, the higher authorities and the CBSE.

UNIT IV

Management of Work Education in Schools

The effective implementation of Work Education programme in schools should comprise the following three dimensions:

1. Scheme of work for the year.
2. Provision of funds and availability of resources – both expertise and materials.
3. Orientation programmes for teachers.

To look after these three dimensions of Work Education in schools, it is essential to have a Work Education Committee under the Chairmanship of the Principal/Head of the school consisting of experts, teachers and students. This committee will have the following functions:

1. Preparation of the scheme of work for the year in a prescribed proforma “A” given in the appendix I.
2. Preparation of an estimate for funds for consumable and non-consumable materials for performing the Work Education activities and use of resources-both men and materials.
3. Overall quarterly evaluation and monitoring of Work Education programme followed by evaluation at the end of the academic session.

Teachers for Work Education

All the teachers of the school should participate in the Work Education Programme. Core areas of Work Education can be taught by all teachers after orientation. In the elective area, teachers can teach elective activities after undergoing training/orientation in the concerned field. However, there may be some elective areas which may require teachers with specialized training. School may employ part-time experts from the community. Schools can also employ a Work Education teacher specialized in one or two areas. He/She will also plan, coordinate and monitor the Work Education programme in the school under the guidance of the Principal.

(Qualification & Skill of the teacher is mentioned under each elective area)

Role of Head of Institution

The Head of the Institution serves as a linkage between the school and implementation of the WEP. He/She has a great responsibility in visualizing, implementing, administrating, supervising and monitoring the WEP, so as to ensure quality and standard of the activities performed in the Institution. The Head of the Institution may have to undergo the following tasks:

- Discuss and plan WE activities with the teachers.
- Develop an institutional plan.
- Coordinate and supervise the WE activities.
- Ensure availability of the infrastructure and funds.
- Motivate teachers in organizing WE activities.
- Arrange in service teacher training.
- Coordinate with district and state education departments.
- Monitor the progress of the programme.
- I valuate the WEP at the Institutional level.
- Provide feedback to the concerned authorities.

Teacher Deployment

All the teachers of the school should participate in the WEP. Activities of the Core component should be conducted by all the teachers, after going through proper orientation and training. Activities of the Elective component should be taken up by the teachers having the required expertise or after going through an intensive training programme in the concerned field. One teacher should be made as the co-ordinator of Work Education programme in the school.

Role of Teachers

Role of a teacher is the central factor for the success of any educational programme. All the teachers must be guided, motivated, oriented and trained to organize the work education activities, based on the subject they teach. Teachers, who are involved in Work Education programme should make an inventory of materials and prepare a tentative instructional plan, which include the objectives, broad contents and highlight the knowledge, understanding, skills, attitude and values to be

developed before carrying out the activity. The instructional plan should also define the assessment procedure(s) to be adopted for evaluating the activity. Teachers need to know the background of the students and should try to get the cooperation and expertise of their parents, especially those who are skilled artisans, craftsmen, farmers and professionals.

The teachers are expected to perform the following functions:

- Assess the needs of the students and community.
 - Select activities based on the principles given in the guidelines.
 - Prepare students for involvement in the activities.
 - Arrange materials and resources.
 - Develop linkages with expert institutions and community.
 - Organize activities and relate them with real life situations.
 - Explain the concept, importance, relevance in related areas and implications on personal and social development.
 - Involve students in campaigns, excursions, educational tours etc.
 - Observe and evaluate students.
-
- Provide feedback to students and administration for improvement.
 - Educate parents regarding the importance of Work Education.
 - Coordinate with parents for referral and follow up of individual cases.

Allocation of Time

At least four periods per week are supposed to be spent on Work Education in classes VI to XII, out of which equivalent of 2 periods may be outside the school hours. Out of the four periods for Work Education, one period may be for the Core Area and three periods for the Elective Area. Some of the activities may be performed during the morning assembly, recess, after school hours- or time available otherwise.

Facilities for Work Education

The schools will have the following two facilities for the effective implementation of the Work Education programme;

1. Physical facilities consisting of accommodation, workshop, tools, equipment, raw materials, etc.
2. Teacher expertise consisting of specialized teachers and other subject teachers with proper orientation and training in concept,

philosophy and methodology of Work Education for specific activities.

Use of Community Resources

Community resources may be utilized for effective implementation of the Work Education programme, but schools should also have funds to allocate minimum resources. Schools also take advantage of local business enterprises, workshops and work centres for work- site training.

Instructional Strategies

A variety of instructional strategies and methods should be adopted to effectively communicate the message to the students. The method adopted should be child-centred, practical, investigative and facilitate reinforcement of living skills. It should permit sharing of ideas, develop in-depth knowledge, understanding and skills and help in acquisition of positive attitude and values. It should also serve as a tool for bringing out creative expressions. Problem solving approach can be utilized to develop analytical and manipulative skills, especially at higher educational stage.

Instructional Material

National Council of Educational Research and Training (NCERT) has prepared instructional materials in the form of curriculum guides, handbooks, source books, manuals, exemplar materials etc. Schools may adopt/adapt these instructional materials after necessary modifications to suit their needs.

The syllabus guidelines in Core and Elective areas will enable the teachers to implement Work Education with real conceptual interpretations.

Instructional Methods

New and dynamic methods, including the use of elective media are to be adopted with a view to inculcate among students curiosity, encouraging self-study and nurture problem-solving abilities.

(a). Methods involving construction and creative activities

- Drawing
- Sketches
- Cartoons
- Posters
- Diagrams

- Graphs
- Charts
- Flannel Board
- Models
- Collage
- Specimen
- Scrap books

(b). Methods involving participation and observation

- Plays
- Puppetry
- Dance
- Drama
- Songs
- Mimes
- Poems
- Games
- Excursions
- Interviews
- Study tours
- Field visits
- Inter-school visits
- Experiments
- Demonstrations
- Discussions
- Brainstorming
- Lecturers
- Debates
- Story Telling
- Newspaper reading
- Slide shows
- Video Film shows
- Radio programmes
- Audio recording & programmes
- Computer-aided instruction
- Surveys
- Quiz
- Media analysis

Visit to Vocational Training Institutions

The school authorities may organize visit to Vocational Training Centres or Production-cum-training Centres to sensitize and motivate students and enable them to practice the various activities and explore the various

career options. The skilled personnel of these institutions may be involved in curriculum transaction, as guest speakers from time-to-time. The VTCs and PTCs will also serve as a resource centre for enterprise education.

Camps

Organization of camps of students can provide an opportunity to the students to live in a community life, away from their homes in order to learn living together, eating together, playing together and working together, for some specific common educational cause. They may learn many social processes, which otherwise, they do not get in their family set-up. Responsibility of organizing camps, deciding the main aims and objectives of camps, properly selecting the activities, selecting the camp sites, duration of camp and arranging various physical facilities etc. will be the responsibility of the school authorities. Institutions can seek the support and assistance from the community leaders. The following activities may be undertaken during camps:

- Literacy campaign – Each one teach one
- Plantation drive
- Cleanliness and sanitation drive
- Organization of cultural, recreational, educational programme during evening hours, aiming at extending some social and educational messages.
- Participation in various awareness drives organized by various departments and organizations.

UNIT V

Strategies for promotion of Work Education Programme

Systematic and intensive efforts are necessary for promotion of the Work Education Programme. The following course of action may be undertaken for this purpose:

Involvement of Community

For effective implementation of Work Education in schools, community support and participation is necessary. A mechanism for involvement and creating a sense of awareness among the local people is to be developed. Professionals and learned members of the community may be involved as guest speaker for explaining the local specific WE activities. The school should establish linkages with Government institutions, artisans, and professionals, business enterprises, work centres, workshops etc. in the community and should take advantage of their expertise in the promotion and implementation of WE Programme.

Awareness and Popularisation Programmes

The school should organize awareness and popularisation programmes in the community for the WE activities offered in the school. The members of community may come forward to help the school in their respective fields of expertise and encourage the children. Exhibition of WE products may be organised as a media for popularisation of WE activities. These programmes will also help the school in the selection and revision of WE activities as per community needs.

Orientation of Parents and Community

Parents need orientation with regard to the Work Education programme, its principles, values, philosophy, need, etc. This is required for ensuring co-operation from them. Special community contact programmes and briefings at the time of school functions may also be undertaken.

Orientation of Teachers

Work Education in various areas as per community needs may be performed both by the work education teacher and other teachers in the school. The Headmaster / Principal of the school may work as a co-ordinator for this purpose.

Counselling of Students

The students at different levels/classes should be counselled about the career options, keeping in view the variety of interests, aptitude and needs of the individuals. Students also need orientation before entering into various pre-vocational courses. Career talk, group guidance and career conference may be organised to facilitate the selection of WE activities by the students.

School Committee

A committee consisting of Head of Institution, enterprising and enthusiastic teachers, representatives of students, parents and enterprises should be constituted for providing necessary input in effective implementation and furtherance of WEP in schools.

Recognition of Teachers for Outstanding Contribution in Work Education.

The teachers who significantly contribute for the cause of WE in a particular session should be given due recognition at the time of annual function. The contribution should find place of appreciation in school magazine. Certain awards may also be thought of depending upon the availability of resources.

Exhibition-cum-sale of Products

Some tangible goods are produced in certain WE activities which require a suitable source of disposal. The products may be disposed of through the co-operative stores of the school or a stall may be arranged at the time of annual function for exhibition cum-sale of products. Income generated through the sale of products or services may be distributed among the Head of the Institution, teachers and students as an incentive for their efforts.

Role of State Education Department

The state department of education through its zonal and district educational authorities may start awareness programme for sounding the general masses, school teachers and students regarding the importance of work education programme as envisaged at the national level from time to time. The Department of Education should prepare handouts, brochures and posters indicating the salient features of work education. Following departments and agencies may be also approached for seeking educational assistance, services and linkage with educational institutions in making work education programme successful:

- Municipal Corporation
- General hospitals
- LIC Branch
- Hospital services
- Agriculture/ Animal
- District Industries Officers
- Husbandry Officers
- Social Service Department
- District/ Divisional Level
- Local Industries / Mills
- Forest Officer
- Local Postmaster
- State Road Transport
- Public Park & Zoo
- Food Corporation of India Ltd.

UNIT VI

Evaluation of Work Education

In the Scheme of Examinations prepared by the Board, the evaluation of Work Education of all classes has been left to the schools. However, the Grades as awarded by the schools in classes X and XII will be reflected in the Board Certificates. It is, therefore, incumbent on the schools to draw good scientific programmes for the evaluation of Work Education.

Programmes planned by the schools for the evaluation of Work Education should be:

1. Objective based
2. Comprehensive
3. Continuous
4. Dynamic

To fulfill these four requirements of evaluation the schools must keep in view the objectives of teaching Work Education listed earlier and try to make an assessment in respect of all of them. More especially the focus must be on the important behavioural changes expected through Work Education.

Evaluation

Learner's evaluation is a process of collecting, analysing and interpreting evidence to judge the level of achievement acquired by an individual learner or a group of learners in cognitive and non-cognitive domains for making variety of decisions. The various basic principles, which should be considered while evaluating the students during and on completion of the activities are given below.

Guiding Principles

- Evaluation to be done according to the objectives of teaching (well-defined in their behavioral terms) as well as the learning experience provided.
- Evaluation should be comprehensive, as far as possible, and must be continuous (each activity/project/unit must be evaluated immediately after its completion).
- In the process of evaluation, as many tools and techniques as possible, should be employed.

- Evaluation must be done based on a detailed pre-drawn plan and pre-determined indicators.
- The process of evaluation should provide necessary feedback towards subsequent and gradual improvement in mastery of skills and perfection in process.
- Considering that the process of evaluation in work education is a difficult and delicate task and the teachers themselves require attaining experience gradually through the process, one should not be over ambitious, but must be sincerely forward looking in his works.

Evaluation Procedure

The stage-wise evaluation procedure, starting from pre-primary to secondary stage should stress on both formative and summative evaluation with the main focus on skill formation.

Basis of Evaluation

The basis of evaluation can be :

- Process
- Product

Evaluation Tools

The evaluation tools, which can be used include :

1. Observation
2. Viva/Interview/Oral test
3. Group Discussion and Debate
4. Written test (Objective type questions)
5. Reports
6. Work Book
7. Feedback Sheets
8. Attitude Scales
9. Practical Exercises
10. Checklist

Some suggested indicators for assessment of Cognitive and Non-cognitive Learning Outcomes

1. Assessment of a product
 - a. Utility
 - b. Durability
 - c. Beauty

2. Assessment of the processes
 - a. Regularity and punctuality
 - b. Orderliness
 - c. Team spirit and cooperativeness
 - d. Patience and tolerance
 - e. Planned and systematic work
 - f. Use of appropriate tools and materials
 - g. Care of tools and leaving them in proper place after work
 - h. Sustainable resource utilization
 - i. Neatness and cleanliness in work
 - j. Positive attitude
 - k. Devotion and honest effort in work
 - l. Perseverance and zeal for perfection
 - m. Self-effort and problem solving spirit
 - n. Workmanship and skill in the performance of work
 - o. Imagination and creativity

The criteria, as listed above, are large in number and varied as many cognitive and non-cognitive capacities that are required to be developed and inculcated among the children for their overall personality development and professional growth. However, this does not mean that all are to be taken into consideration for an assessment. Further, a teacher requires sufficient expertise in conducting assessment. It will eventually be the discretion, judgement and freedom of the teacher to select and consider particular indicator for assessing the process of a particular work unit or project. This will depend upon the degree of teacher's own growth and expertise, the nature and type of the work process, the level of maturity of the learners and the learning situation provided to the students. It is hoped that teachers will strive to grow professionally to handle with ease the assessment of the process of the work units or the projects. Ultimately, an enterprising and professionally committed teacher is the only key to the success of the work education programme.

**Indicators for assessment of students during visit to a place of work
(Occupational exploration programme)**

- a. Discipline and orderly behaviour.
- b. Seriousness in the purpose of the visit.
- c. Interest and inquisitiveness.

- d. Making relevant and probing queries.
- e. Tactfulness in eliciting information.
- f. Avoidance of putting embarrassing questions and making humiliating or derogatory comments.
- g. Showing proper courtesy, respect and dignity to the people, particularly, the workers of the place of visit.
- h. Avoidance of repetitiveness in making queries.

Indicators for assessment of a post visit discussion / debate

- a. Sensitivity and insight developed
- b. Social awareness reflected
- c. Understanding the importance of the economic activities
- d. Understanding the simple and basic facts of life and living through mutual co-operation, participation and contribution.
- e. Patiently listening and allowing to others point of view.
- f. Presenting own point of view.
- g. Observance of proper etiquette, courtesy and respect while interacting with others.

Indicators for assessment of a report of a visit to a place of production-cum-service centre

- a. Detailed, thorough, correct and systematic presentation.
- b. Understanding of the importance of the role played and contribution made by the centre visited (production or services) for the individuals as well as the society as a whole.
- c. Sensitivity reflected
- d. Reflective thinking and feeling developed.
- e. Care, sincerity and seriousness in preparing the report.
- f. Understanding of how various economic activities and public services are going on through the process of their necessary interdependence in the world of work as well as their indispensability individual, society and national life.

Indicators for assessment of a Work Book

- a. Detailed and systematic keeping of records.
- b. Care and neatness in maintaining the work-book .

- c. Regularity in maintaining the work-book and getting regularly checked up by the teacher.

Performa for keeping records

The records may be maintained under the following heads and the workbook should be checked daily as the assessment of the work done on daily basis.

1. Name of the Work/Project
2. Use of the product.
3. Objective/purpose of the work.
4. Tools and equipment used. (Name, Nos., Source of availability)
5. Raw materials used
6. Procedure followed
7. Precautions followed in the process of execution.
8. Difficulties faced in the process and how to overcome.
9. Costing of the product
10. Suggestions for further improvement
11. Self-evaluation and learning outcome.

Grading

It is widely felt that if numerical marks are awarded instead of grades after evaluation, the seriousness towards implementation of the WEP and expected levels of attainment by the students will be enhanced. This issue has been debated time and again and has been explicitly dealt in a document entitled "Grading in Schools" brought out by the NCERT (2000b). The Work Education activities have multiple dimensions-intellectual, emotional, spiritual, ethical, aesthetic, physical, etc., which can be broadly categorized into cognitive and non-cognitive capacities. Assigning marks to the learning outcomes in all these dimensions will be cumbersome and a difficult task for an evaluator. It is, therefore, suggested that the assessment of cognitive and non-cognitive learning outcomes may be carried out by the institution and for awarding grades, the method of direct grading may be employed.

Grades awarded by the schools in Classes X and XII will be reflected in the Board Certificates. It is, therefore, incumbent on the schools to draw a good scientific programme for the evaluation of Work Education.

Grades should be allotted on a 9 – point scale as given in the CBSE grading system as :-

A1 First $1/8^{\text{th}}$ of pass candidates

A2 Next $1/8^{\text{th}}$ of pass candidates

B1 Next $1/8^{\text{th}}$ of pass candidates

B2 Next $1/8^{\text{th}}$ of pass candidates

C1 Next $1/8^{\text{th}}$ of pass candidates

C2 Next $1/8^{\text{th}}$ of pass candidates

D1 Next $1/8^{\text{th}}$ of pass candidates

D2 Next $1/8^{\text{th}}$ of pass candidates

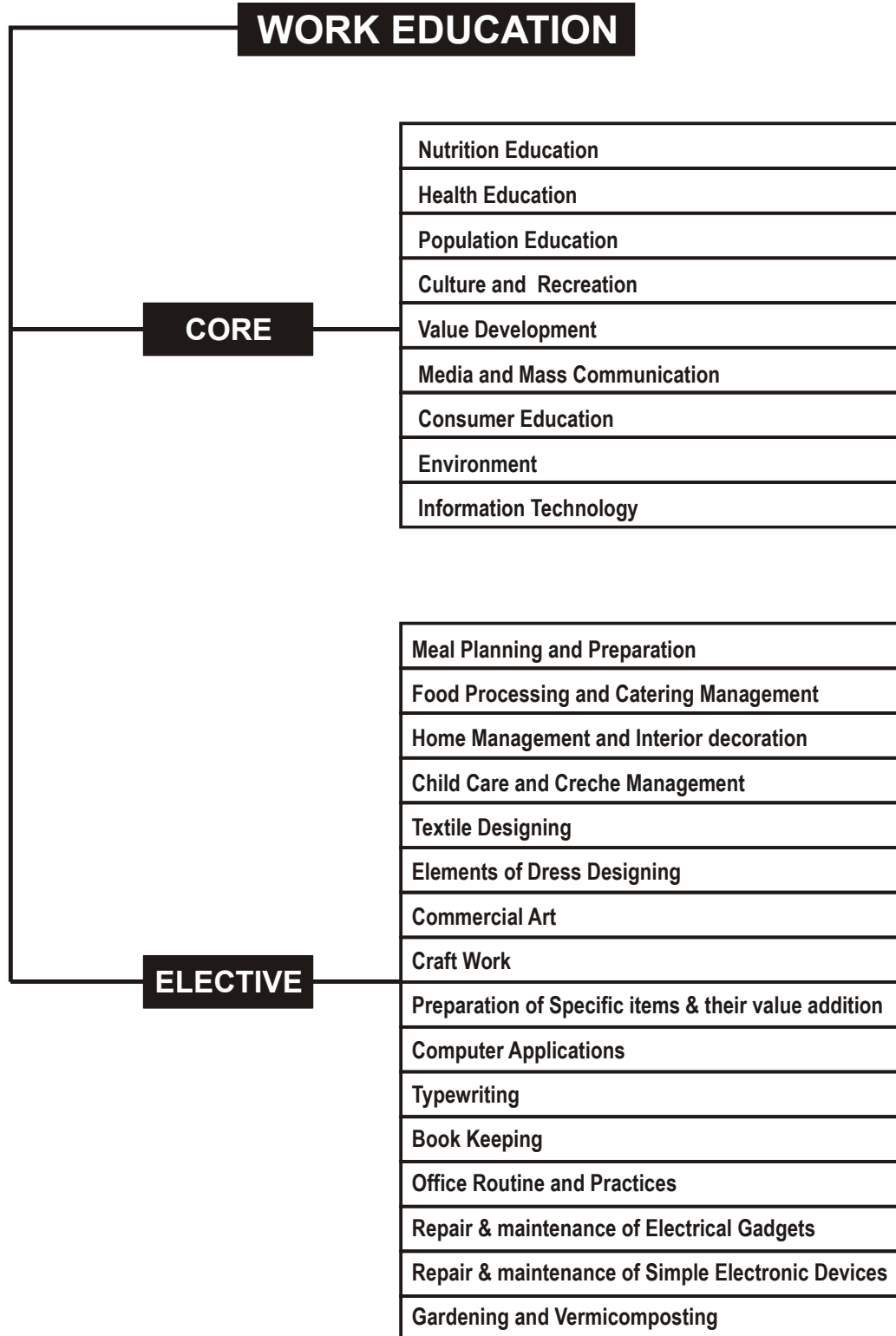
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COMPULSORY COMPONENT

Work may be described as purposive and meaningful manual work, designed to prepare the pupils in producing either goods or services which are useful to the community.

UNIT VII

CORE AND ELECTIVE AREAS OF WORK EDUCATION



CORE AREAS

Core Areas	Sub- Elements	Suggestive Activities in School
1. Nutrition Education	<ul style="list-style-type: none"> • Food- Sources and Functions • 5 Food groups • Nutrition • Concept of balanced diet • Deficiency diseases and their dietary management • Factors affecting food choices • Food borne diseases • Selection and Storage of food • Good eating habits • Nutritional status • Common nutritional problems of school going children – Their awareness 	<ul style="list-style-type: none"> • Poster making • Cooking competitions • Height and weight check up • Canteen Management • Nutrition and Health Quiz • Visits to catering units • Nutrition news – bulletin board, Articles in magazines written by students • Lectures and talks by Nutritionists, involving students and their parents • Nutritious packed lunch parties
2. Health Education	<ul style="list-style-type: none"> • Concept of health (Physical, Social, Mental) • Communicable and non communicable diseases • Prevention and cure of common childhood diseases • Personal and community hygiene • First aid and safety measures • Physical fitness through P.T., Yoga and Meditation exercises 	<ul style="list-style-type: none"> • Health check-ups by doctors • Posters and hoarding competitions • Provision of vaccinations against childhood diseases • Stage shows/ nukkad nataks/skits by students related to health problems and diseases like Malaria, Plague, Dengue, T.B, personal hygiene etc. • Puppet shows for small children.

	<ul style="list-style-type: none"> • Medical check-ups 	<ul style="list-style-type: none"> • Documentary films/ Slide shows for senior students • Quiz • Awareness and encouragement of students to watch health shows on Television • Inter School and Intra School Sports Competitions including Yoga, Aerobics, Meditation.
3. Population Education	<ul style="list-style-type: none"> • Facts and figures regarding population • Adverse effects of over population (Poverty, Illiteracy, Pollution) • Population explosion- its causes • Population control and management • Poor status of girl child 	<ul style="list-style-type: none"> • A school clock can be maintained depicting rising population • Bulletin boards • Stage shows/ nukkad natak / Skits by students • T.V advertisement competitions • Poster making • Year books can be used to maintain demographic data. It can be displayed in the school.
4. Culture and Recreation	<ul style="list-style-type: none"> • Vocal music • Instrumental music • Sports • Drawing and painting • Trips and tours • Celebration of festivals and culture appreciation 	<ul style="list-style-type: none"> • Inter- school and Intra-school competitions • Picnics • Educational trips and excursions • Sports day • Different cultural programmes on T.V can be shown
5. Value Development	<ul style="list-style-type: none"> • Community service • Social service • Adult Education • Non formal education 	<ul style="list-style-type: none"> • Adult education project can be taken up by the school linking it with a nearby slum or rural area • Literacy campaign under "Each one Teach one Project" • School can link with

	<ul style="list-style-type: none"> • Sensitization for problems of old age, child labour, drug addiction, delinquency, corruption etc. • Development of feeling of patriotism, preparing children against social discrimination 	<p>organizations like Rotary Club</p> <ul style="list-style-type: none"> • Visit to Old age homes and Destitute children homes
6. Media & Mass Communication	<ul style="list-style-type: none"> • Newspapers • Audio visual aids • Exposure to educational channels, Distance education programmes • Advertising • Satellite television 	<ul style="list-style-type: none"> • NIE/ PACE project by newspapers • Scrap books/ bulletin boards with newspaper cuttings • Printing of school magazine and periodicals • Dramas and debates on different issues • Educational film shows using projectors.
7. Information Technology	<ul style="list-style-type: none"> • Computer literacy - knowledge of different parts of a computer • Use of Internet • Use of websites • Solving problems through computers 	<ul style="list-style-type: none"> • Slide shows • Power point presentation competitions • Computer Quiz • Home assignments based on internet exploration • CD libraries can be maintained
8. Consumer Education	<ul style="list-style-type: none"> • Definition of a consumer • Problems of a consumer • Inculcating wise buying practices • Standardization and quality of products • Label reading • Consumer laws 	<ul style="list-style-type: none"> • Lectures • Visits to departmental stores, Quality testing laboratories, Consumer forum • Literature can be distributed to students on Consumer Redressal and Standardization marks.

	<ul style="list-style-type: none"> • Consumer rights and responsibilities 	
9. Environment	<ul style="list-style-type: none"> • Environmental sanitation • Pollution and its health hazards • Awareness about pollution management • Concept of reuse and recycle and reduced consumption • Management of resources - fuel, water, electricity • Emphasis on alternative sources of energy 	<ul style="list-style-type: none"> • A council of students can be created where students can be assigned monitoring jobs like monitoring cleanliness in school campus – ground, class rooms, canteen etc. • Facts and figures on community resources can be displayed on bulletin boards • Class wise competitions can be arranged for cleanliness • Best out of waste competitions • Models (Working and non working) display • Visits to concerned places for awareness generation.

☆ **These are only a few suggested activities. The schools are free to take any other appropriate activities of their choice.**

Implementation of Core areas in school:-

1. The entire strength of students can be divided into various Houses/ Squads.
2. Each house can be further divided into Sub-groups and activities of core areas can be allotted to them.
3. These activities can be carried out as Inter-school and Intra-school competitions.

The competitions can be taken up separately for each sub element of the core area.

ELECTIVE AREAS

MEAL PLANNING AND PREPARATION



FIG-1

Need of the community :

Food is the basic need of life. Cooking of food started when the early man discovered fire. Since then, civilizations have undergone food changes many times. The changes in the taste, acceptance and availability of food in different communities has created an urge for meal planning and preparation.

Meal planning is the implementation of the principles of nutrition in one's daily diet in an appetizing way. It helps to plan the meals considering the nutritional needs of the family, within their budget. It helps to save time, energy and fuel. Family members' likes and dislikes can be considered too.

Food can be prepared using a number of methods which impart different appearance, taste and nutritive value to it. Each method has its own advantages and disadvantages. It is a common saying that one eats first with his eyes and then with his mouth. Hence, meal planning is incomplete without serving a well garnished meal.

Learning Outcomes :

Learning how to plan and prepare the meals, the students will be able to ;

1. Select food ingredients suitable for preparing a dish.
2. Select dishes according to the family needs and interests.
3. Explain functions and sources of food nutrients-proteins, carbohydrates, fats, vitamins and minerals.
4. Plan meals for different age groups, according to their requirements, income group.
5. Prepare foods using different methods of cooking like boiling, steaming, roasting, baking, frying, grilling etc.
6. Increase the nutritive value of food by germination, fermentation, combination.
7. Prepare a variety of snacks, dishes, desserts etc according to different cuisines-Indian, Mughlai, Chinese, Italian, Continental etc.
8. Prepare and serve meals to people with special dietary requirements like pregnant, mother, lactating mother, infant, adolescent, old people.
9. Select low calorie foods suitable for people on a reducing diet.
10. Serve meals in an attractive manner (with proper garnishing) to an individual or group, in a seating arrangement or a buffet.
11. Have an idea of the market – different raw and processed foods; their prices and availability.

DETAILS OF ACTIVITIES (CLASS VI –XII)

Class VI

1. To know the Hindi to English names of food stuffs
2. Preparation of mintade/lemonade
3. Preparation of jaljeera
4. Preparation of milk shakes – mango/banana/chickoo.
5. Preparation of vegetable sandwich

6. Preparation of coconut laddoo
7. Preparation of fruit cream
8. Preparation of sprouted dal chat
9. Preparation of fruit / vegetable salad
10. Preparation of bhel puri
11. Scrap book – Paste pictures of junk foods vs wholesome food (Balanced diet).

Class VII

1. Understanding simple cookery terms
2. Preparation of tikki
3. Preparation of chowmein
4. Preparation of potato and peas chat
5. Preparation of mixed vegetable pakoras
6. Preparation of French fries
7. Preparation of poha
8. Preparation of fruit punch
9. Preparation of cold coffee/iced tea
10. Preparation of custard
11. Scrap book – Pasting of pictures of Food Advertisements.

Class VIII

1. Understanding the definitions of food, health, disease, nutrients, nutrition. 5 food groups.
2. Preparation of soup-tomato/mixed vegetable/sweet corn
3. Preparation of eggs-poached, omellette, scrambled
4. Preparation of mango panna
5. Preparation of sago cutlets
6. Preparation of rainbow/ribbon sandwich
7. Preparation of pasta/macaroni
8. Preparation of corn bhel
9. Preparation of ice cream shakes
10. Preparations using condensed milk (like shahi tukra / kheer/ chocolate rolls)
11. Scrap book – Pasting of pictures of food nutrients and food groups.

Class IX

1. Understanding the functions of food
2. Definition of a balanced diet
3. Measuring dry and liquid food stuffs through standardized and household measures
4. Preparation of North Indian snacks - cutlets, burger, potato bondas, paneer tikka, samosa
5. Preparation of South Indian snacks - idli, vada, upma
6. Preparation of pao bhaji
7. Preparation of carrot halwa
8. Preparation of Ice creams
9. Preparation of cheese balls/paneer rolls
10. Preparation of cake (with egg/eggless)
11. Understanding how to serve food and drinks in a tray?
(With proper menu card, flower arrangement, crockery, cutlery, napkin holder etc).
12. Market survey – To find the cost, quality, brand names of different food stuffs (fresh and processed).

Class X

1. Utilizing the process of germination to increase the nutritive value of food – preparation of sprouted dal parantha /raita / halwa.
2. Utilizing the process of fermentation to increase the nutritive value of food – preparation of dosa/bhatura
3. Utilizing the process of combination to increase the nutritive value of food – preparation of pulao,sambhar
4. Preparation of one dish meal-mixed vegetable pulao/stuffed parantha with raita
5. Preparation of Breakfast/Packed lunch for low, middle and high income group person.
6. Preparation of chocolate/ pineapple/black forest icing of cake.
7. Preparation of bread and butter pudding
8. Preparation of dhokla /khandvi
9. Preparation of halwa – suji/wheat flour/besan/dal

Class XI

1. To find out the role of different nutrients (proteins, carbo-hydrates, fats, vitamin A, B Complex, C, D, E and K, minerals - Iron, Iodine and Calcium) in the body. Preparation of any one dish/snack rich in each nutrient.
2. Preparation of snacks and dishes for children like coconut mice, chocolate biscuits, sandwiches, shakes, burgers etc.
3. Preparation of different mocktails
4. Planning and preparation of one meal (breakfast, lunch, tea time, dinner) for adolescent, old person, pregnant and lactating mother.
5. Preparation of Italian cuisine – pizza, pastas
6. Preparation of Chinese cuisine – noodles, chopsyuey, manchurian, spring rolls, fried rice.
7. Preparation of dahi vada/ chat pakori
8. Preparation of biscuits (sweet/salty)
9. Scrap book – Pasting of nutrition and health articles, recipes from magazines and newspapers.
10. Report writing on T.V. cooking and health shows.

Class XII

1. Planning and preparation of low calorie dishes/snacks/drinks.
2. Planning and Preparation of dishes for infants – porridge / dalia / khichri/soups.
3. Preparation of Mughlai cuisine – biryani, koftas, dal makhani, dum aloo, naan etc.
4. Preparation of Continental cuisine- macaroni cheese pie, soufflé etc.
5. Preparation of burfi-coconut/chocolate/carrot/besan
6. Planning for a party – Preparation of pulao, baked vegetables, paneer dishes, pulses, kofta, any dessert like phirni/gulab jamun/pudding etc.
8. Understanding how to set a table for tea time, lunch/dinner (seating and buffet arrangement). Different techniques of napkin folding and flower arrangements.

Suggestive Laboratory Equipment :

Gas stoves, utensils, oven, refrigerator, mixer grinder, suitable ingredients according to the recipe, crockery, cutlery, table linen.

Theory portion should be supported with teaching aids like charts, models, diagrams, books showing relevant pictures. Slides and transparencies can be prepared wherever possible.

Qualification of the Teacher :

Teacher with a Master's/ Bachelor's degree in Home Science or a Diploma in Home Science from a recognized university or polytechnic is most eligible for taking the subject.

Product outcome :

All practicals involving cooking will result in the production of dishes/snacks etc. The cooked items may be first judged by the teacher and then circulated in the school to get feed back. However, time to time these food products may be put on sale or exhibition of these goods may be held in the school.

Record work :

A proper Meal Planning file should be maintained to record the theoretical details and recipes of dishes prepared. The file should be well decorated with suitable pictures. These files may also be displayed in the exhibition. Relevant charts and models can be prepared for different topics which can be displayed too in the home science laboratory.

Evaluation :

Each cooking practical should be evaluated there and then. Grades may be allotted to the students based on their planning, preparation, cooking and serving. Grades may be on a 9 point scale rating as A1, A2, B1, B2, C1, C2, D1, D2, E (as per prescribed CBSE grading system)

The file may be evaluated side by side Evaluation has to be continuous, objective based, comprehensive and dynamic. Final evaluation should be based on both practical grades and file assessment. Cumulative records should be meticulously maintained for all the students.

FOOD PROCESSING AND CATERING MANAGEMENT

Need of the Community :

With so much of economic and social development, rising industrialization and urbanization, food has also undergone a lot of change. That is more demand of food which is available in less time at convenience. Twenty first century has witnessed a large number of working women. Food processing has opened the doors of convenience for everyone having less time and energy to spend on cooking for a party or a small gathering or cooking for festivals etc, therefore the role of catering industry came into existence. We all have more instances of eating out or ordering food from outside now as compared to the past because food is readily available at each and every corner of our colony. This has led to the mushrooming of a number of eating outlets, fast food centres, restaurants etc.

Work education must offer students an opportunity to learn food processing and catering management in senior classes so that they can find themselves associated with these areas in future and can take these areas further either as a main stream, side stream as a vocation or for family use etc.

Learning Outcomes :-

The student will be :-

1. Understand various methods of food preservation at home. Prepare and store preserves.
2. Understand and learn different methods of food processing.
3. Understand various food groups and their nutritive contribution in the diet.
4. Do menu planning in details for a day for meal, for a simple person/family, for Indian/International groups, for different income groups.
5. Develop skills in purchasing and storage of quantity food.
6. Develop knowledge and skill in quantity food production.
7. Serve food in various styles (Traditional and Modern) eg: Buffet, in tray etc.

8. Understand physical facilities of a catering unit with sanitation and safety requirement.
9. Develop skills of setting up a food processing unit.
10. Understand the problem of food adulteration, its health hazards, ways of testing food adulteration.
11. Identify and select packages of material for processed food.
12. Read the label on food materials and evaluate them.
13. Understand different food laws and government regulations for quality control of products.

DETAILS OF ACTIVITIES (CLASS IX – XII)

Class IX

1. Understand what is food processing and catering management?
2.
 - a. Collect different labels of processed foods.
 - b. Read the labels and evaluate them.
 - c. Design a complete label for any food product.
3. Food preservation – Its concepts, principles.
4. Preparation of Jams (apple / plum, mixed) and Squashes (lemon/mango/orange). Pack, label and store it.
5. Sundry fruits and vegetables, prepare frozen peas. Give the steps involved.
6. Market survey to identify the processed foods available in the market – different brands, cost and availability.
7. Cooking of soups, salads and snacks. (various types)
8. Scrap book- Collect and paste various original labels with their duplicate labels.
9. Visit a canteen to study how well it is managed?

Class X

1. Food adulteration – Its definition, various adulterants used, hazards caused due to food adulteration. Study of various food laws to protect against food adulteration. Tests to identify food adulteration.

2. Define food safety, factors causing food spoilage(microbes, toxins, food additives, chemicals and pesticides).
3. Methods of food preservation at household level – dehydration, sun drying, refrigeration, use of oil and spices, use of chemical preservatives.
4. Preparation of tomato ketchup, chutney (tomato/mango), tomato puree. Pack, label and store it.
5. Learn the art of serving food -Traditional and Modern, serving in a tray.
6. Plan, prepare and pack a lunch with drink to be supplied in an office.
7. Understand different food laws and Government regulations for quality control of products. (PFA, ISI, FPO, AGMARK).
8. Cooking of cereals, pulses and beverages (various types).
9. Visit a fast food restaurant to see how it is managed?

Class XI

1. Market survey and observations on packaging materials / containers used for packing fruits and vegetables. Analyse various packaging materials for preserved foods.
2. Preparation of Pickles (lemon, mango, mixed vegetable). Pack, label and store it.
3. Processing of different foods – cereals, legumes, fats and oils.
4. Understand the concept of planning meals for different age groups – infant, a school going child, adolescent, adult, old person. Plan a single meal for them. Cook and serve properly.
5. Learn table setting for breakfast / tea time, lunch / dinner- both seating and buffet arrangements.
6. Understand 5 food groups and their nutritive contribution to the diet.
7. Plan and prepare a meal for quantity cooking of 25 people. Serve meal appropriately.
8. Cooking of vegetables, sandwiches, desserts (various types).
9. Visit a packaging unit / bottling and canning plant to get familiar with the process of packaging.

Class XII

1. Preparation of Jelly (guava) and marmalade (orange). Pack, label and store it.
2. Processing of different foods – Milk and milk products, tea and coffee, sugar and jaggery.
3. Plan a day's meal for an Indian family (with different income groups – LIG, MIG, HIG). Cook any one dish from the planned meal.
4. Plan a single meal – Italian, Chinese, Continental, Mughlai. Cook and serve dishes and snacks.
5. Develop skills of setting up a Food Processing Unit (Theory only). Understand the physical facilities of a catering unit with sanitation and safety requirements.
8. Cooking of accompaniments (Curd Preparations, starters), bakery items, ice creams (various types).
9. Visit a bakery / confectionary unit.

Suggestive laboratory Equipment:

Gas stoves, utensils, crockery, cutlery, table linen, menu card, flower arrangement, refrigerator, oven, ingredients according to the recipe, test tubes, chemicals for food adulteration tests (like dil HCl, dil HNO₃, Carbon tetrachloride, iodine, ether etc.)

Qualification of the teacher :

The teacher with a Master's / Bachelor's degree in Home Science or a Diploma in Food Processing and Catering Management is most eligible to take the subject.

Product Outcome:

A variety of dishes and snacks will be prepared which can be evaluated there and then. They can be circulated to others to get a feedback. Quantity cooking can be organized in the school during any meeting (Seminar / any small gathering). The evaluation may be done by all the guests.

Record Work :

A record file should be maintained to record recipes, reports of visits, planning work and other theoretical details. A market survey file / scrap book should be prepared separately wherever mentioned. All the file records should be well decorated and presentable. Certain charts and models can be prepared for topics like food adulteration tests, setting up of a food processing unit.

Evaluation :

Each cooking practical should be evaluated there and then. Grades should be allotted to the students based on their planning, preparation, cooking and serving. Grades should be allotted on a 9 point scale as per CBSE grading system.

The files may be evaluated side by side and grading done. Final evaluation should be based on both practical grades and file assessment.

HOME MANAGEMENT AND INTERIOR DECORATION

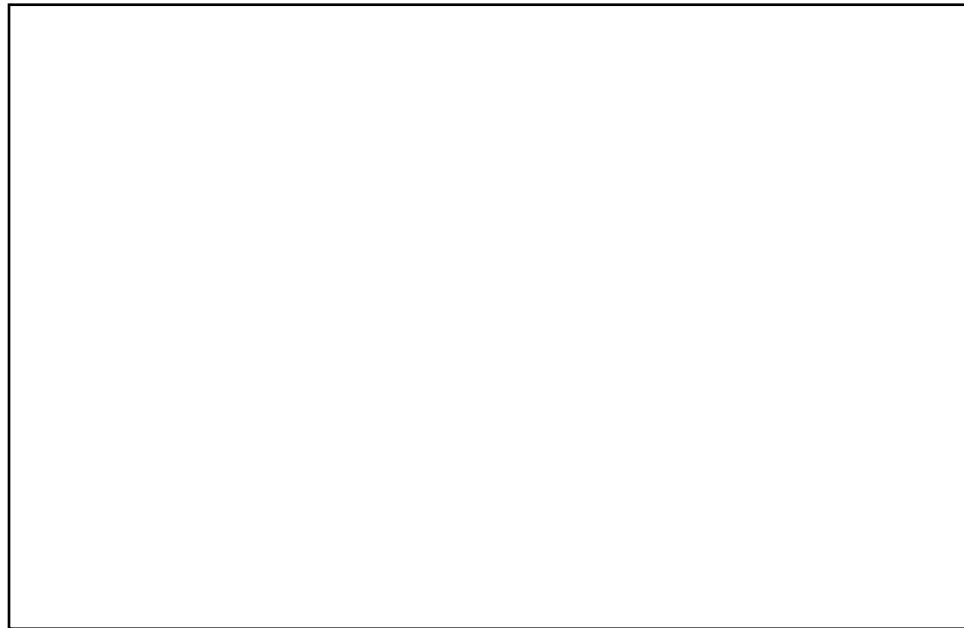


FIG-2

Need of the community :

With the fast development of the economy, women have stepped out of home. With increasing pressures at home and at work place, there is a need for the students - both male and female to learn home management. India which is a developing country is providing its citizens a lot of chance to change their life styles and with the changed life styles, it is very important to maintain the interiors of home which is the crux for family's happiness.

This elective area of Work Education i.e. Home Management and Interior Decoration has been designed to make students excellent home makers so that they learn proper utilization of resources and decision making. This course helps them not only to be the designers of their own home but to be excellent in professional life if they further link up to the concerned vocational areas.

Learning Outcomes :

After learning Home Management and Interior Decoration, the student will be able to ;

1. Understand the elements and principles of art.
2. Have knowledge of the principles of housing.
3. Acquire skills to do house planning on paper with special emphasis on the activity areas like kitchen, living room, laundry, ironing area, dining area etc.
4. Acquire skills of floor decoration (Rangoli) and flower arrangement (Ikebana).
5. Have knowledge of care and maintenance of clothes and household equipments.
6. Make some trendy paintings and lighting fixtures.
7. Understand furniture and furnishing selection and planning.
8. Acquire skills of landscaping.
9. Inculcate skills of computer aided designing in higher classes (if possible).
10. Have concept development about various styles of interiors.
11. Learn techniques to clean and polish articles made out of different metals.

DETAILS OF ACTIVITIES (CLASS IX- XII)

Class IX

1. Survey and visits to explore household equipments, decorative accessories, furniture and furnishings with their arrangement (only pictures). Maintain a proper record.
2. Understand the Colour Wheel – Primary, Secondary, Tertiary colours. Dimensions of colour – hue, value, intensity.
3. Preparing any one painting for Drawing room (which is in trend).
4. Understand the steps of laundry (only theory). Starching of cotton clothes.
5. Planning of study centre / dining area / hobby centre (dimensions of furniture, arrangement of goods in the form of a rough paper plan).
6. Making artificial flowers using duplex or crepe paper, velvet or satin cloth or any thing else.
7. Preparation of a glass painting work (on window pane, mirror / crockery / bulbs etc).
8. Table setting and manners.
9. Cleaning and polishing of silverware.
10. Visit to a restaurant / any catering unit.

Class X

1. Survey and visits to note the landscaping and planning of houses (LIG, MIG, HIG flats, independent) and evaluate them on the principles of housing. Maintain a proper record.
2. Understand Colour Schemes- Related and Contrasting.
3. Making floor decoration- from different states, using different items like coloured powder, saw dust, flower petals, poster colours etc.
4. Starching of silk clothes.
5. Planning of a laundry centre in the house.
6. Preparation of a wall hanging with embroidery work / patch work / appliqué work / mirror work / paintings.
7. Cleaning and polishing of brass article.
8. Visit to a boutique / garment industry.

Class XI

1. Survey and visits to note down different styles of interiors in homes. Maintain a proper record.
2. Making floor plans of houses showing kitchen, bed room, study room, drawing room, verandah etc. Decoration with colour schemes.
3. Making flower arrangements and Ikebana (Using fresh flowers).
4. Washing and ironing of wool.
5. Pest control measures – cockroach, ant, lizard, houseflies, rats etc.
6. Market survey- Collect samples of carpets, curtain cloth, sofa cloth, glass, wood, sunmica, bed linen etc. with their cost.
7. Preparation of Gel candles.
8. Cleaning and polishing of ceramics and tiles.
9. Visit to a dry cleaner's shop.

Class XII

1. Survey and visits to note down different styles of interiors in hotels, restaurants, rest houses, offices etc.
2. Making floor plans of rooms with colour schemes for different age groups (old/young) and activity areas (kitchen / lobby / bed room / study room etc).
3. Understanding elements and principles of art.
4. Making of lighting fixture (Lamp shade). Study of household lighting- direct / indirect, natural / artificial.

5. Preparation of pillow covers/cushion covers using fabric painting/ block printing/screen printing.
6. Cleaning and polishing of leather goods.
7. Study of storage areas in the home (rooms, kitchen). Suggest improvements. Prepare rough sketches.
8. Visit to a laundry unit / weaving unit.

Suggestive Laboratory Equipment :

Depends on the selection of the topic and the decision of the teacher.

Qualification of the teacher :

Teacher with a Master's / Bachelor's Degree in Home Science or a Diploma in Home Science from a recognized university or polytechnic is most eligible for taking the subject.

Product outcome :

All assignments should be evaluated individually based on the efforts put in to prepare them and the product prepared. The goods may be then displayed in the school.

Record Work :

A proper record file should be maintained for survey work, floor plans and other theoretical portions. Paintings / fixtures / wall hangings etc. prepared have to be submitted for evaluation.

Evaluation :

Each assignment has to be evaluated side by side in terms of the product prepared. File work should also be evaluated and grading done, as per CBSE grading system. Final evaluation term wise should be based on both products prepared and file assessment.

CHILD CARE AND CRÈCHE MANAGEMENT

Need of the Community:

Twentieth century has witnessed women working not only at the home front but also working out for a career. Though the women have become career oriented, the family has been their first priority always. Once a woman leaves her home, her children become her first liability to be looked by other substitutes. Here arises the need of trained people for child care and crèche management. If Work Education in schools could train some students for the same, it would be a great contribution for a balanced and healthy society. These trainees can prove to be excellent substitutes in the absence of the mother. It would also be wonderful experience for students for preparation of their own family life in the future. Crèche is an institute where children between 0-6 years are professionally looked after efficiently in the absence of their mother.

Learning Outcomes:

The student will be able to;

1. Develop knowledge of the principles of growth and development of the child from 0-6 years.
2. Develop understanding of the milestones of child's physical, mental, social, cognitive, language, motor development.
3. Understand the requirements of an ideal crèche.
4. Inculcate in themselves the skills of child rearing like feeding the child, bathing the child, keeping him clean, playing with the child etc.
5. Understand the nutritional requirements of children. Develop skills in preparing food for them (milk and weaning foods for infants, snacks and simple meals for children).
6. Acquire knowledge of first aid and medical facilities to be given to the children in case of emergencies.
7. Understand the importance of hygiene and sanitation in the crèche.
8. Develop skills in arranging play activities for children of different age groups.
9. Understand the common childhood diseases and their care and management.
10. Develop knowledge of ways of preventing the diseases with special emphasis on immunisation.
11. Educate the children by a play-way technique.
12. Acquire skills of crèche management with customer satisfaction.
13. Have a knowledge of keeping accounts, maintaining budgets (income and expenditure record) for efficient crèche management.

DETAILS OF ACTIVITIES (Class XI-XII)

Class XI

1. Understand the principles of child's growth and development. Paste relevant pictures.
2. Learning milestones of various developments like physical mental, motor, language, cognitive, social. Observe a child (0-2 years) at home / in neighbourhood to judge his development.
3. Prepare an album (photo album or picture album) to show different aspects of development in a child (0-2 years).
4. Making students aware of various childhood problems like food jags, aggression etc.
5. Prepare Food and Nutrition requirement (RDA values) table for a child from 0-6 years of age.
6. Understand the concept of weaning foods – their importance and types. Prepare weaning foods for an infant like dalia, porridge, khichri, soups, premixes.
7. Make flash cards/flip book depicting a short story for a preschool child.
8. Observe a child at home / in the neighbourhood to the trained for child's cleaning, bathing and feeding.
9. Identify the common childhood diseases – their prevention, care and management, control.
10.
 - a) Prepare an immunisation chart for a child from 0-5 years.
 - b) Collect immunization charts / cards from various nursing homes. Paste them in the file.
11. Visit a crèche/day care centre and record the various facilities offered by it. Take photographs and prepare a report.

Class XII

1. Observe a preschooler (2-7 years) at home/in neighbourhood and judge various aspects of his development – Physical, mental, motor, language, cognitive, social.
2. Plan few fine motor skills and gross motor skills activities for a preschool child.
3. Develop an educational game for a preschool child based on his development level.
4. Understand the food and nutrient requirements for a preschool child. Prepare few snacks and dishes for him (sandwiches, shakes, poha, upma, stuffed, paranthas, bread pakora etc). Learning how to serve meals to them so that the child is tempted to eat food.

5. Plan a layout of a crèche on paper/graph, with special emphasis on various activity areas (cooking area, sleeping area, play area, study area, washing area etc).
6. Make an appropriate model (Thermacole/Plywood) of an ideal crèche with all its activity areas.
7. Learning the management of a crèche – Arranging various facilities, maintaining cleanliness, arranging ayas/maids, keeping budgets, organizing outdoor activities/trips/picnics.
8. Watch various documentaries/cartoon films/health shows for children. Analyse them and develop play-way methods of educating small children. You can plan activities – both indoor (with blocks, alphabet games, collage work of fruits and vegetables etc) and outdoor (with balls, on swings etc).

Suggestive Equipment :

A neighbourhood crèche or a preschool/day care centre can be used for observing children.

Materials required for developing games, models, photo/picture albums, flash cards / flip books depends on the activity chosen. Cooking practicals require gas stove, utensils, ingredients, crockery and cutlery for children.

Qualification of the Teacher :

A teacher with a Master's/Bachelor's degree in Home Science or Nursery teacher's training from a recognised University / Institution is eligible to take the subject.

Product Outcome :

Certain educational games, flash cards/flip books, photo/picture albums will be developed. A working/non working model of an ideal crèche can be developed by students in a group. All material developed can be put on display.

Record Work:

A record file has to be maintained to record all the activities done with children. Report writing of the visit should be done. Photo album/picture album, flash cards/flip book, games kit have also to be prepared. The files should be made colourful and attractive by pictures, real children photographs, diagrams, collage work by children etc. Recipes of weaning foods and other dishes for children may be recorded on recipe cards.

Evaluation :

The record file, photo album/picture album, flash cards/flip book, model, recipe cards and all other things should be evaluated separately and grades allotted to them as per CBSE 9 point grading system. Evaluation has to be dynamic and continuous. Cumulative records should be maintained for all students. Final evaluation should be done on the basis of the student's involvement with the children in the field, and his record work.

TEXTILE DESIGNING

Need of the Community :

Clothes have been the means of enhancing personality and giving identification, a way of self expression for a very long time – may be from the beginning of civilization. In good olden times, vegetable dyes were used to design fabrics. Pictures of animals and natural scenes were depicted on clothes. All important eras of history have their characteristic textile designing. In today's world, textile designing has been revolutionized by various techniques of mill dyeing, printing and finishing. Students can also take up some textile designing activities not only for beautification of their own clothes but also as an income generating activity. This course includes different sub parts like Tie and dye, Block printing, Screen printing and Fabric painting.

Learning Outcomes :

The student will be able to ;

1. Select dyes appropriate to the clothes eg. Direct dyes can be used only for cotton.
2. Identify and understand all types of colour pigments, dyes, binders, fixers and other chemicals appropriate for different types of textile designing.
3. Prepare layout, draw and select colour schemes for two or more colours for different textile designing methods.
4. Select right kinds of blocks, prepare them and use them for block printing. They should be able to prepare table for block printing.
5. Weigh dyes, fabrics and understand the chemical reaction in dyeing.
6. Tie clothes using different techniques and materials, to depict creativity.
7. Understand how to fix colours to make them permanent.
8. Trace or draw design for fabric painting using butter paper, blues and mineral oil technique.
9. Do different kinds of shading in one or more colours.
10. Prepare one or more colour screens, set them on cloth and do screen printing.

11. Develop skills to use hot wax for proper shade, light and tonal value of dye for batik printing.
12. Understand different heat treatments to be given for different printing techniques
13. Design apparel, pillow covers, table cloth, cushion covers etc using different printing techniques.
14. Develop self esteem through achievements in productive work.

DETAILS OF ACTIVITIES (CLASS VI – XII)

Class VI

1. Fabric Painting

- Collect tracings of flowers, leaves, geometrical designs.
Trace them on handkerchiefs with the help of carbon paper.
- Learn the use of acrylic colours, different brushes.
- Learn how to stroke colour with brushes
- Paint handkerchiefs using single colours
- Paint a tray cover using two colours

- 2. Block Printing** – Print book mark, book cover/file cover, greeting cards using vegetable blocks, feathers, nails etc. Decorate with glitters.

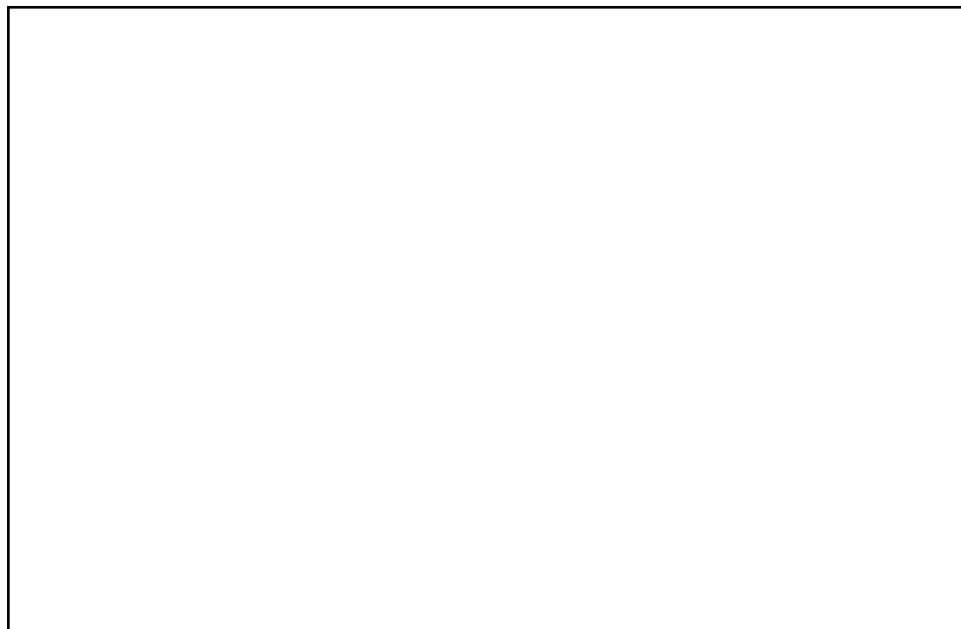


FIG-3

3. **Scrap Book** – Paste samples / pictures of fabrics with fabric painting or block printing.

Class VII

1. Fabric Painting

- Trace cartoon figures and other geometrical figures on table cloth and table mats.
- Paint table cloth and table mats using two or three colours
- Learn the technique of shading using different frames
- Understand the concept of colour wheel – Primary, secondary, tertiary colours

2. Block Printing

- Using wooden blocks and ready to use colours, print a set of six handkerchiefs (single colour)
- Print a dutches set using wooden blocks (with border design and central motifs).
- Make own cut design stencil and spray colour on the cut area.

Class VIII

1. Fabric Painting

- Trace different figures/designs using butter paper and blue / used dry cell and mineral oil.
- Paint 2 pillow covers, music system cover.
- Learn how to mix-match colours and prepare new colours with colour schemes.

2. **Block Printing** – Using wooden blocks and ready to use colours, print a TV cover/Table cloth in 2 to 3 colours. Make a border on the cloth with blocks.

3. **Tie and dye** – Understand the different techniques of tying the fabric like folding, bandhani, marbelling, knotting, laheria, tritik etc.

- Understand how to prepare the dye.
- Tie and dye cotton handkerchiefs in single colour.
- Fix the colour so that it becomes permanent.

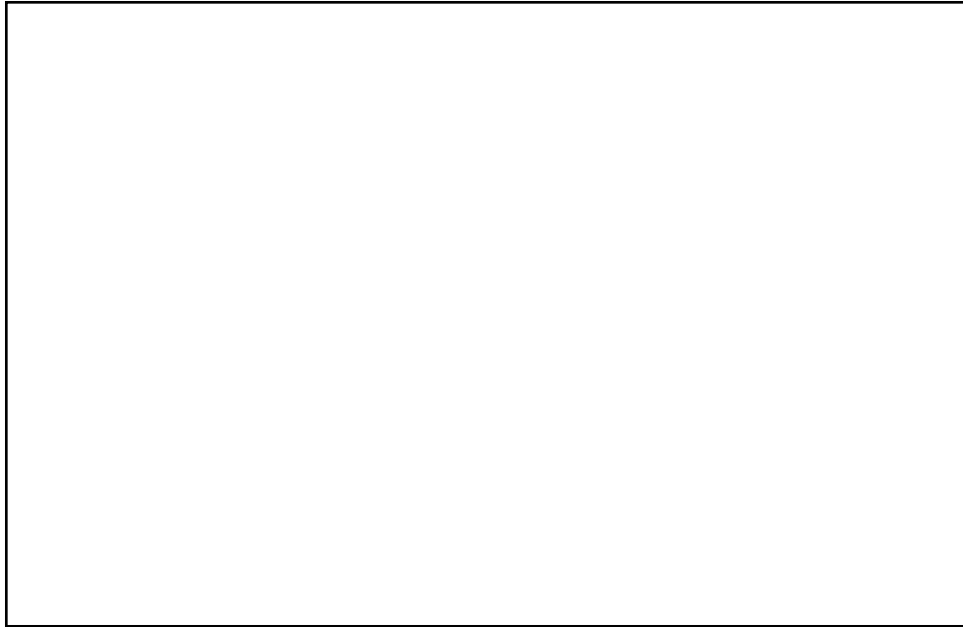


FIG-4

Class IX

1. Fabric Painting ;-

- Draw / trace a painting/wall hanging 1 feet X 1 feet and paint it with proper shading.
- Understand related and contrasted colour schemes and incorporated them in their painting.
- Paint a jute shopping bag.

2. Block Printing

- Learn how to set up the table with padding for block printing.
- Learn to prepare own colour with binder, fixer, acramine dyes.
- Prepare a cushioned file cover/magazine rack using block printing technique.
- Provide suitable heat treatment to the fabrics.

3. Tie and Dye

- Tie and dye a cotton dupatta in two colours.
- Tie and dye a bandhanwar for the entrance of a puja room. Decorate it with shells, doris, mirrors etc.

4. Screen printing

- Learn how to prepare own colour with binder, fixer, acramine dyes.
- Learn how to use a screen.
- Using readymade screens, print a cotton T-Shirt in one colour.

5. Batik

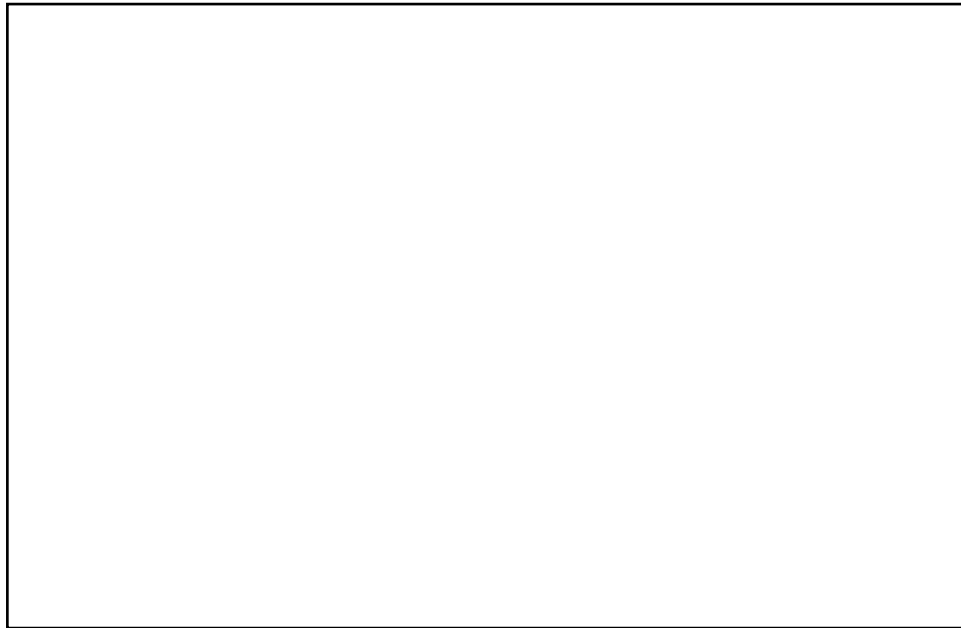


FIG-5

- Learn the use of hot wax in single colour
 - Understand the cold dyeing process.
 - Print handkerchiefs using batik technique.
 - Dewaxing of the cloth.
6. Visit Block printing unit /Dyeing unit.

Class X

1. Fabric Painting

- Prepare the Prang's colour chart/wheel.
- Understand different types of related and contrasting colour schemes.
- Paint a dining table sheet (using drawings/tracings of fruits and vegetables pictures).

2. **Block Printing** - Print a set of six table mats and six napkins for a dining table. Use double blocks.
3. **Tie and dye**
 - Tie and dye cushion/pillow covers in 2 to 3 colours.
 - Tie and dye a cotton shirt/ T-shirt using tritik technique.
4. **Screen Printing** – Using readymade screens, print a cover for a music system/refrigerator top.
5. **Batik** - Prepare a wall hanging (horizontal / vertical) using two colours.
6. Visit a Boutique to learn about various textile designing techniques.

Class XI

1. **Fabric Painting** – Paint a double bed sheet using fabric colours. Use frame, wherever necessary. Proper outline of the design should be done. Beautify the design using gold/silver dust.
2. **Block Printing** – Print a suit with dupatta using blocks.
3. **Tie and Dye** – Understand the varied colours used for dyeing silk and cotton separately.
 - Tie and dye a cotton saree.
 - Tie and dye a silk scarf.
4. **Screen Printing** – Learn how to prepare own screen in a single colour.
 - Print three towels of different sizes.
5. **Batik** – Prepare a wall hanging with animal/human figure using three colours.
 - Prepare a hand bag with batik printing.
6. Visit a Screen printing workshop/Weaver's centre.

Class XII

1. **Fabric painting** – Paint a suit and dupatta. Shade using golden and silver colour. Frolica may be used for beautification.
2. **Block printing** – Print a bed sheet for dewan with two bolster covers.
3. **Tie and Dye** – Understand the type of colours used to dye wool.

- Tie and dye a woollen muffler.
- Tie and dye an old and faded sweater / woollen baby blanket.
- 4. Screen printing** – Prepare 2 to 3 colour screens.
 - Print pillow covers/cushion covers in 2 to 3 colours.
- 5. Batik** – Print a ladies top/Kurta in two colours.
 - Print a fabric for lampshade
- 6.** Visit Textiles/Handicraft exhibition.

Suggestive Laboratory Equipment :

Fabric, frames, table, light source, paints, brushes, water, Tie and dye/block printing/screen printing/batik colours, binder, wax, mustard oil, paddings, old newspaper sheets, foam, jute cloth, blocks (wooden/metallic), gas stove, containers, wooden spoon, screens, squeeze.

Qualification of the teacher :

Teacher with a Master's/Bachelor's degree in Home Science or a Diploma in Textile Designing from a reputed university or polytechnic is most eligible for taking the subject.

Product outcome :

A variety of apparels, wall hangings and table linen will be prepared using different printing techniques. Time to time these products can be put on exhibition or sale in the school.

Record Work : A record file should be prepared to record theoretical details on colours and printing technique procedures. Small samples of each fabric technique may be pasted in the file. Report of visits done in the year may be recorded too.

Evaluation :

The record file should be assessed from time to time and grading can be done as per CBSE grading system. The products prepared using different techniques should be evaluated side by side and grading done. Work should be evaluated based on design, neatness, colour combination and product outlook.

ELEMENTS OF DRESS DESIGNING

(Cutting, Tailoring, Knitting and Embroidery)

Need of the Community :

Clothes happen to be our primary needs whether they are meant for protecting us against heat, weather, rain or providing us comfort. We need clothes for self expression and personality development. They provide us identity hence there is a need for development of interest and skills among students for cutting, tailoring, knitting and embroidery i.e. Dress Designing. If taken seriously, some of these skills can be enhanced and taken up as a vocation ahead.

Things like embroidery and other needle work has been a passion among women for communicating their love and emotions for others. These skills provide a source of personal satisfaction besides providing a career ahead.

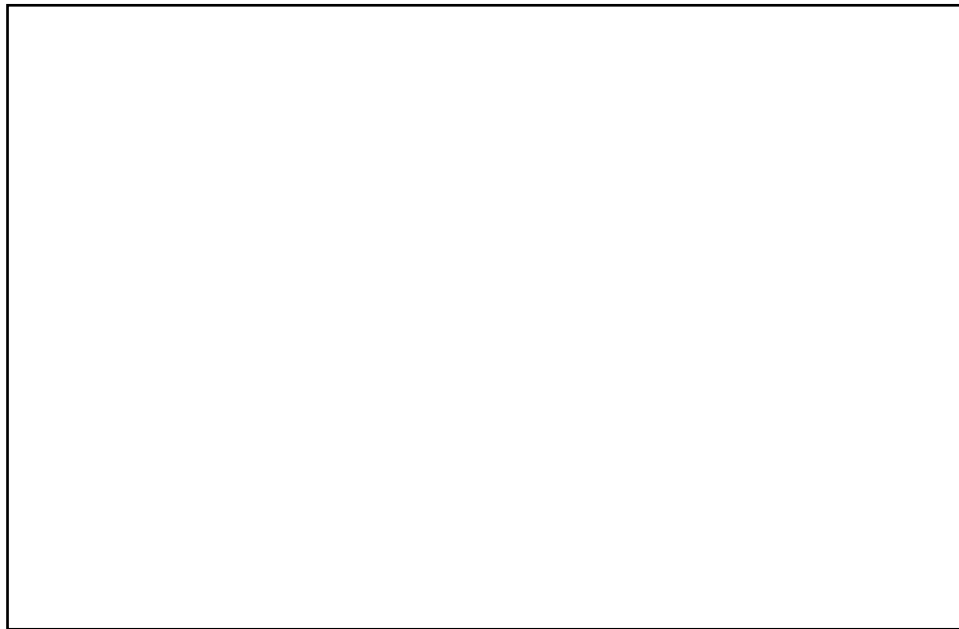


FIG-6

Learning Outcomes :

The student will be able to ;

1. Identify tools required for cutting, tailoring, knitting and embroidery.
Understand parts of a sewing machine.

2. Prepare samples of basic stitches.
3. Draft, cut and stitch simple articles like child's bib, jhabla.
4. Develop skill of making a paper draft and its use in making garments like baby frock.
5. Draft, cut, stitch and decorate with piping, lace, or embroidery an apron.
6. Develop skill of measuring and cutting of materials, finishing raw edges.
7. Embroider articles using different stitches like cross stitch, lazy daizy, satin stitch, shadow work etc.
8. Select proper designs for embroidery and mirror work, with appropriate colour schemes.
9. Understand and use knitting abbreviations and instructions.
10. Develop skill of casting on and casting off the stitches.
11. Learn how to increase or decrease stitches and stitching of knitted articles.
12. Develop the skill and ability to read, understand and copy the knitted patterns from a book or a magazine.
13. Learn how to repair garments using darning.
14. Collect ideas from the environment for designing and stitching of clothes.
15. Evaluate the workmanship of a readymade garment.

DETAILS OF ACTIVITIES (CLASS VI – XII)

Class VI

1. Identification of tools required for tailoring
2. Preparation of samples of basic stitches like even tacking, uneven tacking, running stitch, hemming.
3. Identification and use of tools required for embroidery work.

4. Making six handkerchiefs with simple embroidery stitches like lazy-daizy, stem stitch, chain stitch, herringbone stitch.
5. Making a tray cover using herringbone stitch.
6. Identification and use of knitting tools.
7. Casting on and casting off of stitches.
8. Knitting of a scarf/muffler.

Class VII

1. Use of Sewing machine and its maintenance.
2. Stitching of simple straight long ropes to give practice of straight stitching.
3. Preparation of samples of piping, facing.
4. Preparation of samples of seams-plain seam, run and fell seam, french seam.
5. Drafting, cutting and stitching of a child's bib using seams, finishing with piping. Simple embroidery may be done on the bib.
6. Embroider table mats with chain stitch, feather stitch, button hole stitch.
7. Knitting of booties for a baby.

Class VIII

1. Preparation of samples of different types of buttons with button holes, lace fixing.
2. Understand the parts of a sewing machine, threading of machine and use of machine.
3. Drafting, cutting and stitching of an apron and decorate it with lace.
4. Embroider two pillow covers using different stitches
5. Preparation of a wall hanging using cross stitch.
6. Preparation of knitting designs using books.
7. Knitting of Baby Baniyan for a child using simple knitted design.

Class IX

1. Preparation of samples of gathers, pleats, tucks.
2. Drafting, cutting and stitching of a jhabla for a child. Decorating it with piping, lace and embroidery. Also putting a patch on its pocket.
3. Embroider a TV cover on mattie/casement fabric.
4. Knitting of a sweater, using two colours.
5. Scrap book – Paste pictures of children garments and embroidery designs.

Class X

1. Drafting and cutting of a child's bodice block on paper.
2. Adaptation of child's bodice block to an A line frock on paper. Cutting and stitching of A line frock. Decorating it with different embroidery stitches.
3. To evaluate the workmanship of a readymade garment.
4. Embroider a table runner (using varied stitches).
5. Knitting of front open Baby set. Putting of fancy buttons and making button holes.

Class XI

1. Drafting of adult's bodice block.
2. Adaptation of adult's bodice block to a ladies shirt. Cutting and stitching of shirt.
3. Drafting, cutting and stitching of salwar /churidar pyjama.
4. Embroider a dutchess set of organdie using kantha work.
5. Learning to read and understand the abbreviations used in pattern books for knitting. Preparation of samples of different knitting designs.
6. Scrap book- Paste pictures of knitting designs, different necklines and collar designs.
7. Visit a fashion house to learn about different techniques of dress designing.

Class XII

1. Preparation of samples of smocking.
2. Drafting, cutting and stitching of nighty or house coat. Decorate with smocking.
3. Preparation of samples of darning.
4. Embroider cushion covers with mirrors.
5. Knitting of baby's frock/skirt using designs and colours.
6. Demonstration of machine embroidery/machine knitting by various sewing machine/knitting machine companies.

Suggestive Laboratory Equipment :

Fabric, sewing machine, knitting needles, wool, stitching needles, thread, embroidery threads, frame, paper, scissors, embroidery and knitting books.

Qualification of the teacher :

Teacher with a Master's / Bachelor's degree in Home Science or a Diploma in Dress Designing (cutting, tailoring) from a reputed university or polytechnic is most eligible for taking the subject.

Product outcome :

A variety of stitched, embroidered and knitted garments will be prepared. These garments can be put on display or even sale.

Record Work :

A record file should be prepared to record the bodice blocks; paste samples of stitches, embroidery designs, knitting. Report of visits and demonstration seen may be recorded too.

Evaluation :

The record file should be assessed regularly and grading done as per CBSE grading system.

The garments prepared by stitching, embroidery and knitting should be assessed separately on completion and grades allotted to each.

Final grading will be based on the sum total of grades given to the file and all garments.

COMMERCIAL ART

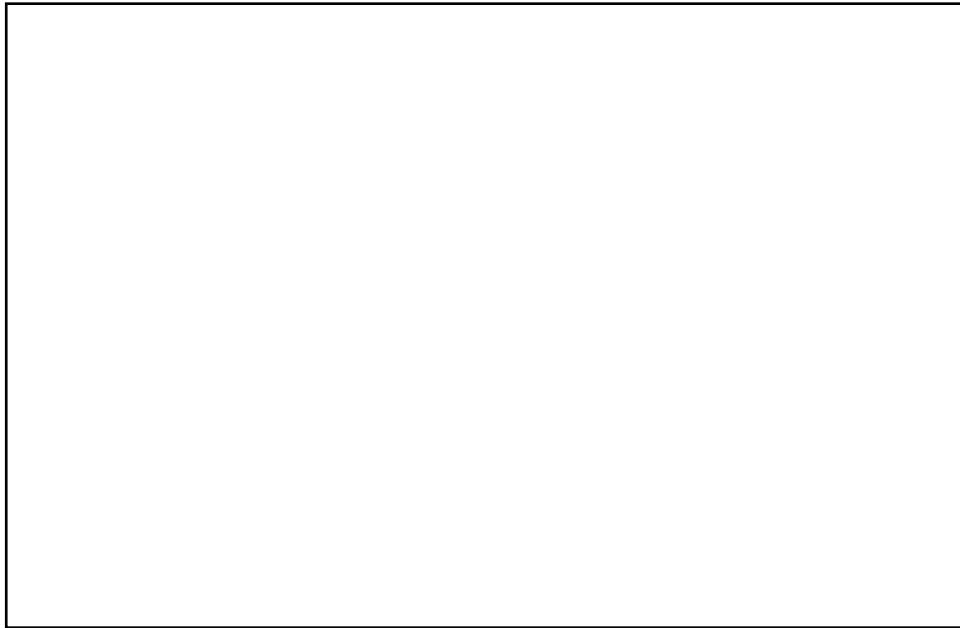


FIG-7

Need of the Community :

Art (Viz painting, drawing, cutting and pasting etc) is the earliest form of expression that a child uses, even before learning to communicate through vocal and written language. Even though he cannot speak, he can tell you how, he feels or what he wants to say through drawing.

Art is also a common language for the people of the world. People of the some country with different languages and from different cultures depict their feelings through art. We may not be able to understand them, their ideas and thoughts through words, but we definitely can feel them through their works of art. Art infact, is the best and most convenient form of expression. You really don't have to be a great artist to do it, art is a part of every human being one or the other way.

Understanding and appreciation of art develops our aesthetic sense. It keeps alive the glory of our country, of man kind and our culture. To summarize, it widens our vision.

After learning commercial art, the student can become an artist, designer etc.

Learning Outcomes

The student will be able to ;

1. Handle different pencils i.e. 2B, 4B, 6B etc; pens, bamboo pens and charcoal etc.
2. Handle different types of brushes.
3. Develop his colour sense.
4. Write in a decorative way with proper spacing.
5. Improve observation through sketching from nature and human beings.
6. Use different types of paper.

DETAILS OF ACTIVITIES (CLASS IX - XII)

Class IX

1. Writing alphabets and numbers in “gathic style” with measurements in pencil and fill with colours.
2. Writing English, Hindi or regional language alphabets with a bamboo stick pen (Freehand).
3. Acquiring skills of sketching moving human figure with shading.
4. Copying monograms, symbols and trademarks of different companies and products.
5. Preparing a press ad in pencil or monotone (Black only).

Class X

1. Writing alphabets “Roman style” with pencil.
2. Writing quotations in any style (Gathic or Roman) in any medium.
3. Preparing poster layouts in colour.
4. Sketching human figure and foliage.
5. Learning perspective, ratios and light and shade in still life.

Class XI

1. Further practicing still life, foliage and human figure.
2. Prepare a poster in any media (i.e. pencil shading, collages and colour).
3. Develop skills of portrait study (detail face anatomy).

4. Drawing creative composition (illustration) in colour.
5. Preparing book covers in colour or collage.

Class XII

1. Practicing still life with drapery in pencil shading or colour.
2. Learning Packaging (cartoon or wrapper designing).
3. Preparing story illustration in colour.
4. Object drawing in monotone (single colour).
5. Designing magazine cover or advertisement.
6. Graphic designing (lino painting or printing).

Equipment Required :

Brushes, colour, rubber, pencil, coloured paper, chart Fevicol, table, donkey chairs, models, enough lighting.

Qualification and skill of the teacher :

Teacher with a Bachelor's Degree in Fine Arts (BFA) / Commercial Art or a five year diploma holder from any recognized institute is most eligible for taking the subject.

Product Outcome :

Each assignment will come as a painting or a piece of art which can be put on display in the school exhibition and school premises.

Record Work :

Daily assignments should be done in a drawing file and sketch file. Certain pieces of work (large size) may be done on sheets and folders of these should be maintained.

Evaluation:

Each assignment of commercial Art should be graded separately in each term. A combined or comprehensive grade should be given (as given in the CBSE grading system) based on the files and other pieces of work.

CRAFT WORK

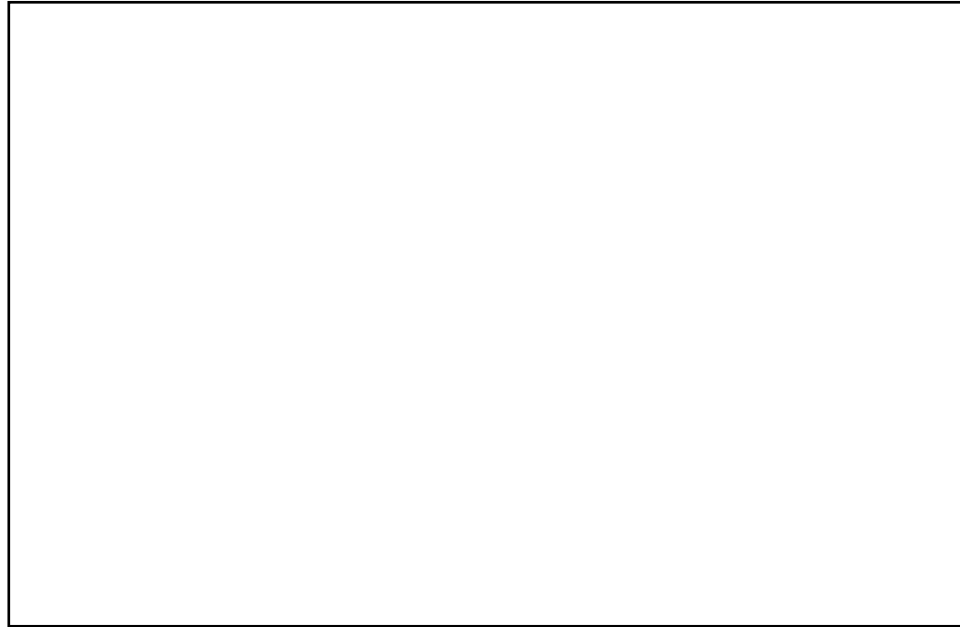


FIG-8

Need of the Community :

India is a land of artisans and craftsmen. Indian population has a lot of inherited potential and capabilities which they project out through their craftwork. It is one skill through which students can project their hidden talents. Craftwork not only keeps them busy but gives them satisfaction also. Moreover, with changing life patterns, there is a rising demand of handicraft items. Indian handicrafts are luring the west too. There is a fusion of east with west. These products are in great demand abroad as well as in the country. People prefer the traditional settings display at homes, offices, hotels etc. The trend is towards hand paintings, mural work, papier mache work, artistic pottery, bread crafting, clay modelling etc. Gone are the days when these crafts were restricted to rural areas. They have reached now the classes and the masses.

The learning of craft work begins with junior classes but if taken in details later too, the seniors can show excellent craftsmanship. This can become a good source of appreciation for them, thereby enhancing their personality and helping them to choose a vocation ahead.

Learning Outcomes :

The student will be able to ;

1. Develop aesthetic sense by doing various kinds of craftwork.

2. Acquire knowledge and skill of matching colours and colour schemes.
3. Use paper and make attractive and useful items using it.
4. Acquire skills of making articles like fruits, vegetables, animals, birds, decorative pieces using papier mache.
5. Acquire technique of varnishing papier mache articles to maintain their freshness and durability.
6. Identify clay soil used for clay modelling.
7. Prepare wet soil and use plaster of paris for clay modelling.
8. Develop skills to construct different types of knots in jute, nylon and cotton threads for macramé work.
9. Use the knots given to threads to give different shapes thereby creating different designs in macramé work.
10. Select appropriate fabrics, tools and materials for making different stuffed toys and dolls.
11. Develop sense of neatness, accuracy and proportion while cutting different parts of the body of a doll or a stuffed toy.
12. Develop skills of preparing wall hangings keeping their aesthetic value and creativity.
13. Identify and prepare certain useful products for home use like laundry bag, T.V. cover, refrigerator top cover.

DETAILS OF ACTIVITIES (CLASS VI-XII)

Class VI

1. Paper Work

- a) Prepare different types of flowers using paper (crepe/duplex).
- b) Prepare a bunch / bouquet of flowers.
- c) Making a book cover with hand made sheet of paper.

2. Papier Mache

- a) Preparation of papier mache clay for moulding.
- b) Moulding of conical shape and round shape vegetable and fruit.
- c) Prepare a pen holder using papier mache.

3. Clay Modelling

Prepare any two flowers, any two fruits and any two vegetables using clay.

4. Doll Making

- a. Make a Santa Claus using egg shell, paper, cotton, wool, card board, fevicol.
- b) Make a standing doll/clown, using empty talcum powder container, velvet paper, sponge, satin, mirrors, gota-kinari etc.

Class VII

1. Paper work

- a) Prepare a paper bag using hand made paper.
- b) Make paper envelopes (of different sizes).
- c) Prepare a waste paper basket by pasting papers.

2. **Papier Mache** – Prepare wall hangings by fixing other things like stones, broken tiles, metal pieces.

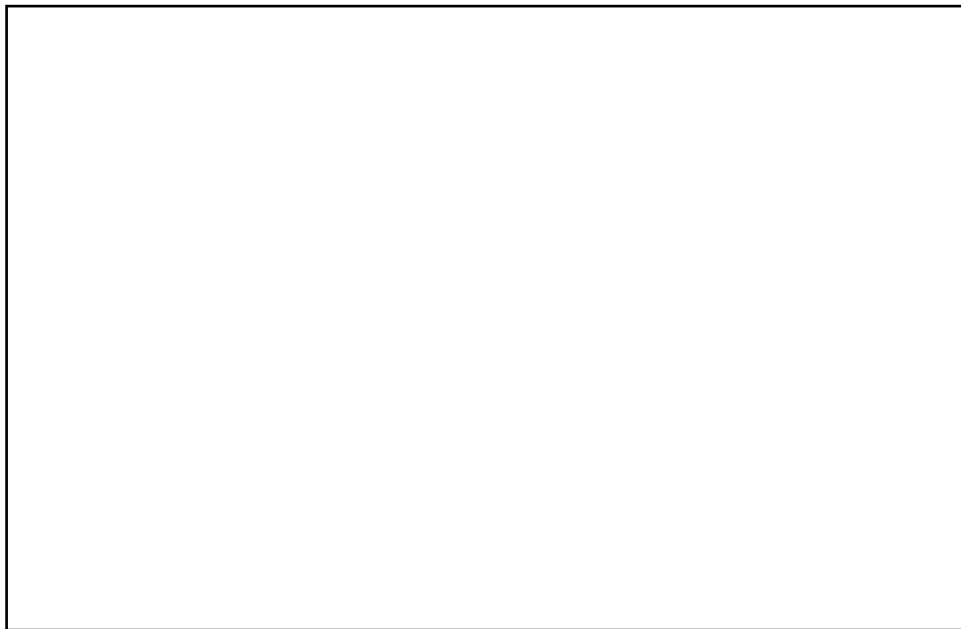


FIG-9

3. **Clay Modelling-** Prepare any 2 masks and any 2 pottery items using clay.

4. Doll Making

- a) Make a doll using shuttle cock/any bottle.
- b) Make a cat using old wool, cardboard, thread, needle, pin etc.

Class VIII

1. Paper work

- a) Prepare masks (animal/human)
- b) Prepare puppet with paper.

2. Papier Mache

- a) Prepare a bird/animal using this technique.
- b) Prepare a flower vase using papier mache.

3. Clay Modelling

- a) Prepare a flower pot, decorate it with clay carving.
- b) Prepare clay models of face of a man or a woman.

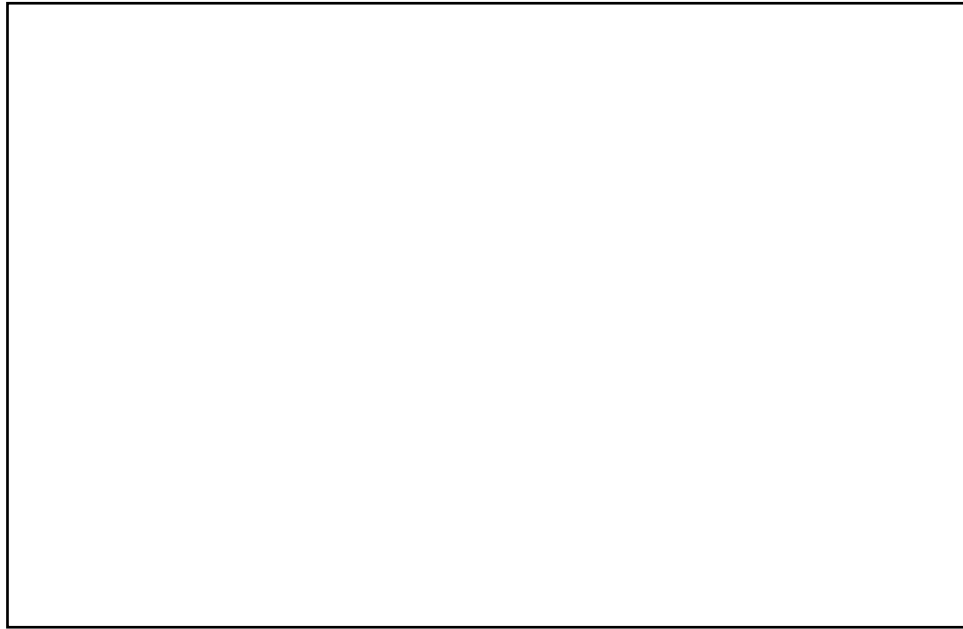


FIG-10

4. Doll Making

Make a pair of dolls –Bride and bridegroom of any one state of India out of socks.

Class IX

1. Paper Work

- a). Understand different techniques of paper napkin folding.
- b). Prepare a X-Mas tree using chart paper and tissue paper.

2. Doll Making

Prepare a pair of dolls depicting a man and a woman with different hair styles and clothing or knitted dolls and their clothing.

3. Soft Toys

- a) Make a bear / leopard / rabbit / any animal.
- b) Make a parrot / crow / any bird.

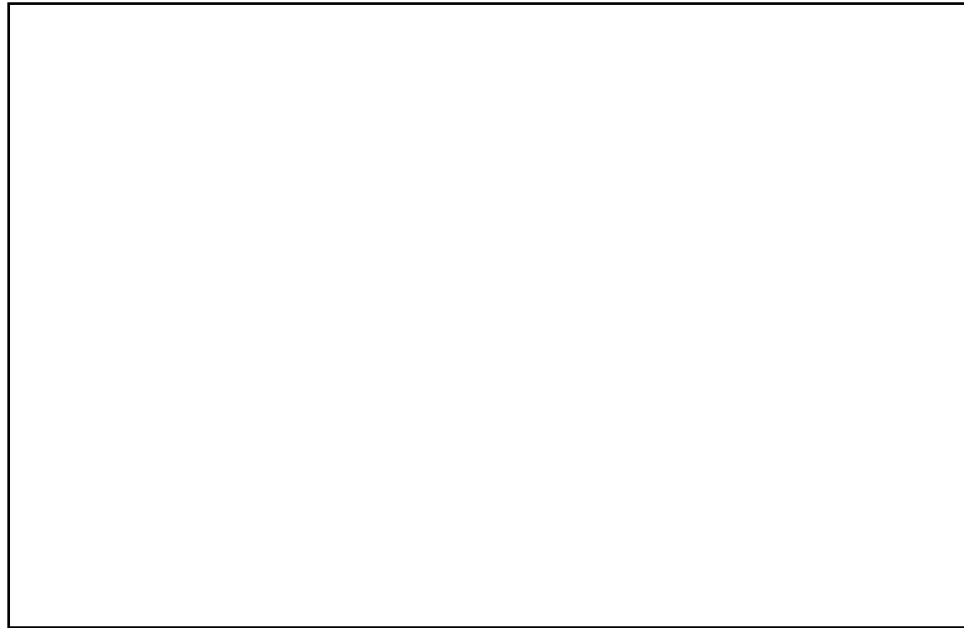


FIG-11

4. Macrame Work

- a) Construction of different types of knots in jute, cotton and nylon threads.
 - b) Learn to use these knots to give different shapes.
 - c) Prepare table mats using nylon or plastic thread and jute thread.
5. Prepare small money purse using flannel cloth, beads, mirrors etc.

Class X

1. **Paper Work**- Prepare face of a king/queen using handmade paper.
2. **Doll making** – Prepare a banjaran doll, Mirabai doll/any couple.
3. **Soft Toys** – Make a penguin / Donald duck / Micky mouse.
4. **Macramé work**
 - a) Prepare a floor mat using nylon or plastic or jute threads.

- b) Make a toy such as an animal or a flower using plastic wire, pipe, beads, glass pieces, glass pipes etc.
- 5. Prepare a laundry bag using jute/flannel/casement fabric.

Class XI

- 1. **Paper work** – Make an invitation/greeting card with envelope.
- 2. **Soft toys**
 - a) Make a dog faced/kitten faced small bag.
 - b) Make a hen family- One hen with three chickens.
- 3. **Macrame Work** – Prepare flower pot holders/hangings using plastic or nylon threads.

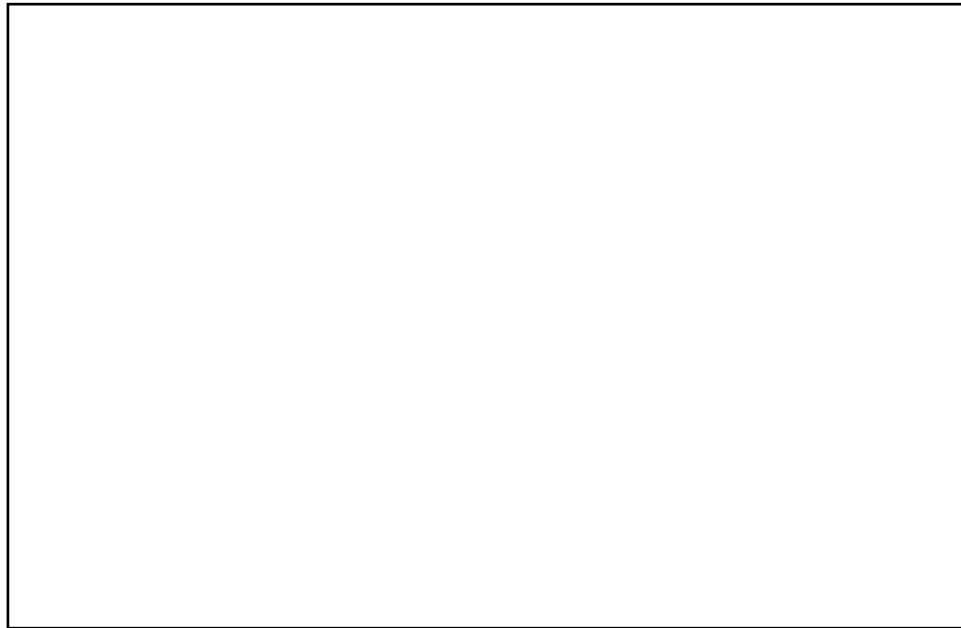


FIG-12

- 4. Prepare a saree cover/shirt cover using clothes. Give a quilted effect. Decorate with a patch.
- 5. Decorate a steel thali for puja purpose (with gota, kinari, mirrors, net, dori etc).
- 6. Make a big wall hanging using broken bangle pieces pasted on a plyboard. Decorate it using mirrors, beads of different colours etc.

Class XII

- 1. **Paper work**
 - a) Make and design a table/wall calendar.

- b) Prepare different kinds of papers using ordinary papers like by pasting flower petals, by shading and colouring etc.

2. Soft Toys

- a) Make any 2 puppets - hand/glove/string.
- b) Make an apple/strawberry/tomato etc. shaped pillow for a child.

3. Macrame Work – Prepare small bags like hanging bag/shopping bag/hand bag using jute, hemp cotton, plastic or nylon.

4. Prepare T.V. cover / refrigerator top cover using net, laces, clothes. Decorate it.

5. Make a big wall hanging using saw dust (dyed in different colours) pasted on a plyboard. Decorate it with other things.

NOTE : The teacher is advised to take up any handicraft activity (like dari making, cane work, basket weaving etc.) using locally available raw-materials and demand in the community.

Equipment Required :

Different types of paper like crepe paper, duplex paper, ivory sheet, hand made paper, chart paper, glazed paper, velvet paper, cartridge sheet, tissue paper. Scissors, gum, fevicol, mirrors, beads, broken bangles, ribbons, satin, colours, brushes, sponge, empty bottles, wool, different threads, different types of clothes, gota-kinari, dori, wires, jute, nylon, cotton thread for macramé, small jewellery for dolls, flannel cloth, fur, cotton, clay, plaster of paris, measuring tape.

Qualification of the teacher :

Teacher with a Bachelor's Degree in Applied Art (BFA) or a 5 year Diploma in Fine Arts / Applied Art is eligible to take the subject.

Product outcome :

A number of craftwork items like paintings, toys, wall hangings, papier mache products, dolls, pottery items etc. will be prepared by the students which have to be kept intact and displayed in the school during exhibitions.

Record work:

A record file may be maintained to record the procedures of preparing different articles. It may be decorated with pictures of the concerned articles.

Evaluation :

Each article prepared under craft work is very time consuming and involves a lot of labour. Hence the assessment has to be regular and continuously done to see the child's input and then the output product. Grades should be allotted to all items as per the CBSE grading system. Final evaluation has to be the sum total of all grades given for different items. Record file may also be considered while doing the final evaluation.

PREPARATION OF SPECIFIC ITEMS AND THEIR VALUE ADDITION

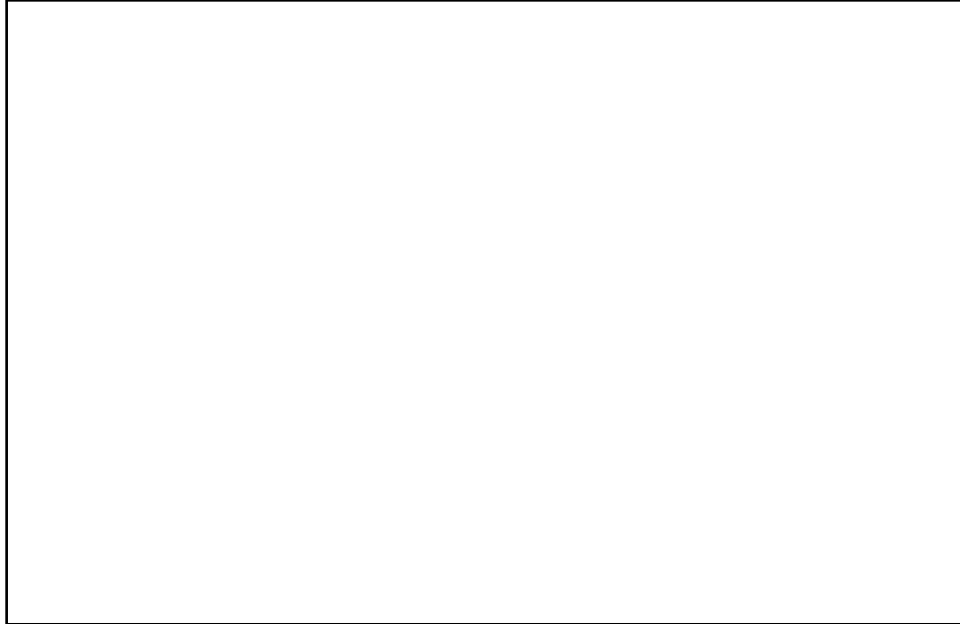


FIG-13

Need of the community:

There are various objects which are required in our daily life and can be easily prepared by the students themselves using their skills and imagination. This can then become a very good source of income generation if the project is taken up on a larger scale. Small things like gift wrapping and creating best out of waste products are good hobbies and a source of entertainment as leisure time activities. Objects like candles and Terracota products can be made during festival seasons and they are very good source for enhancing creativity among the students. These items can be gifted by the students to their friends and relatives and they can express their emotions through them. Hence the objective of Work Education i.e, training hand as well as mind is totally fulfilled here.

Learning Outcomes:

The student will be able to ;

1. Select appropriate waste materials. Make best use of waste and make utility products with them.

2. Prepare different types of candles or with or without using moulds.
3. Develop skills of wrapping gifts attractively.
4. Understand the composition of various soaps and detergents; and prepare them in the laboratory.
5. Develop the skills of painting and decorating different types of pots/ Terracota items.
6. Prepare different types of lighting fixtures with varied bases - wooden/ ceramic/ plastic/ metal.
7. Prepare different types of masalas – chana masala, chat masala, rajma masalas, jaljeera powder, pao bhaji masala, garam masala, sambhar masala etc.

DETAILS OF ACTIVITIES (CLASS VI-XII)

Class VI

1. Gift wrapping

- a. Making of ribbon bows and frills of various kinds.
- b. Packaging of birthday gifts for children.
- c. Packaging of toys for gifting.
- d. Use of glitters, sparkles and other decorative items.

2. Best out of waste

- a. Use of waste materials like rakhi, stickers, pictures, boxes, cans etc. to prepare dustbins / pen stands / stationery holders.
- b. Use waste bottles and other disposable items for growing cactus/ indoor plants. Decorate the base.

Class VII

1. Gift wrapping

- a. Making paper and cloth flowers with craft work. Use of different types of clothes like silk, satin, velvet, net.
- b. Gift wrapping of a child's dress.
- c. Wrapping of a pack of greeting cards.
- d. Wrapping toffees, fruits, fruity packs, Jam and pickle bottles.

2. Best out of waste

- a. Using broken glass or tiles prepare ceramic painting and murals.
- b. Using old pictures, stickers, cards; prepare book marks and calendar.

Class VIII

1. Gift wrapping

- a. Use of waste material in gift wrapping like old rakhis, doris, mirrors bangles etc.
- b. Making envelopes for shagun.
- c. Packaging Diwali gifts, Holi gifts, Christmas gifts, New year gifts.
- d. Packing a child's stationery kit.

2. Best out of waste

- a. Making puppets with broken doll's face.
- b. Using old marriage cards, greeting cards and gift papers; prepare shopping bags.

Class IX

1. Gift wrapping

- a. Making of gift wrapping paper with leaf painting, fruit painting, block printing.
- b. Preparation of puja thali and coconut for puja.
- c. Wrapping of sweet and dry fruit packs.
- d. Wrapping big packs of bottles, bakery items, fruits etc.
- e. Wrapping of accessories like bangles, cosmetics, jewellery items in pouches.

2. Best out of waste

- a. Using cloth cuttings, prepare a cushion cover or a handbag.
- b. Used embroidered fabrics can be used to make patch for a dress/ apron.
- c. Use old crockery for preparing gel candle.

- 3. Preparation of soaps** for different purposes such as washing, bathing etc. (solid and liquid both)
- For bathing soap: Mahua oil-500 gm, caustic soda-100 gm, coconut oil-500 gm, caustic potash-140 gm, Green colour-2 gm, Aonla essence-5 gm.
 - For washing soap: Mahua oil- 1 kg, caustic soda- 250 gm, silicate-250 gm, water-1.5l.
 - For liquid soap; Acid. (slati hard)- 500gm, salari (slati soft)-500gm, caustic soda-200 gm, Urea-500 gm, T.S.P.-200 gm.

Class X

- 1. Gift wrapping** - Different wrapping techniques like packing a round gift, square gift, rectangular gift, toffee shape, melody shape.
 - Wrapping a gift for man/woman / child.
 - Wrapping with perfumes and artificial flowers.
 - Wrapping of bridal clothes like lehanga, heavy sarees with palloo, ordinary sarees, suit with dupatta.
- 2. Best out of waste –**
 - Using old clothes which have become useless or are burnt or cut somewhere (like old saree, dupatta, jeans), prepare magazine holder/ bag/ saree cover.
 - Using waste polythenes or bags or old socks, prepare a mat/ dari.
- 3. Preparation of Detergent powder and Shampoo**
 - For detergent powder:- Iodate powder-1 kg, soda ash-700 gm, TSP-100gm, reetha extract-200 gm, colour-5 gm.
 - For shampoo:- bathing soap-100gm, glycerine-25 gm, aonla-250 gm, water-5 l, reetha-250 gm, colour-5 gm, shikakai-250 gm, essence-25 gm.

Class XI

- 1. Candle Making –**
 - Introduction to materials used for candle making like paraffin, colour, wicks, moulds, gel etc.
 - Collection of pictures and shapes of various candles

- c. Preparing paraffin candles in pottery/ diyas/ animal shapes etc.
- d. Preparing birthday candles, Diwali candles, Christmas candles
- e. Learning packaging of candles for gifting, costing of candles for sale.
- f. Take a candle making project for handicaps, slum dwellers, mahila mandals etc.

2. Terracota (Value Addition)

Things like readymade terracotta products which are widely available in the market can be purchased at a very nominal price and they can be painted in different colours and different decorative items can also be used to add value to them. They can be fixed in plaster of paris on a board or directly on wall in the lobby, in the garden or in the temple etc. Terracota pots can be used as the base for lighting fixtures also.

3. Making a lighting fixture (lamp)-

- a. To get an idea of direct and indirect light.
- b. Survey and picture collection of a variety of fixtures available in the market.
- c. Identifying the area of the house where different lighting fixtures can be installed.
- d. Selecting a lamp base for eg.-
 - i) Wooden (eg. Statue, log of tree etc.)
 - ii) Wrought iron / pipe mouldings
 - iii) Glass (eg. bottles, toys etc)
 - iv) Terracota (eg. pot statue etc)
- e. Getting the wire, plug and lamp holder fixed in the base with the help of an electrician.
- f. Selecting a lamp shade (latest in trend) either from the market and enhancing them by paint and brush and different decorative items or using a frame and covering it by any material of your choice to make a lampshade.
- g. Selecting the right kind of bulb.
- h. Evaluating the lamp design for its functional efficiency.

Class XII

1. Candle making-

- a. Preparing decorative candles for New year (in different sizes and shapes).
- b. Preparing gel candles (floating and scented) in glass crockery.
- d. Decoration of ordinary candles using sparkles, mirrors, glitter etc.

2. Terracota (Value addition)

Faces of different Gods like sun, Ganesha etc. in the form of face masks, wall hangings, terracotta idols; toys, pots, kullars, fountains, containers, statues, vases etc can be enhanced in their value by creatively painting or decorating them using Acrylic colours, glitters, metallic colours, kundan stones and other decorative stones, metal jewellery and other accessories like mirror, dori, sequins etc.

3. Masala preparation

To prepare different types of powdered masalas like chana masala, chat masala, rajma masala, jaljeera powder, pao bhaji masala, garam masala, sambhar masala etc.

Suggestive Equipment :

Some specific equipments required for different activities have been listed along with the product to be made. Remaining materials required can be decided by the teacher.

Qualification of the teacher :

Teacher with a Bachelor's Degree in Home Science or Fine Arts (BFA) or a five year Diploma in Fine Arts / Applied Arts from any recognized institute is eligible for taking most of the topics in the subject. For few topics like soap and detergent preparation, masala making; help may be sought from the concerned subject teacher.

Product Outcome :

All products need a lot of time and labour. Each activity will produce different types of finished products like Terracota pots, lighting fixtures, soaps, detergents, masalas of different kinds, candles etc.

Record Work :

Though most of the work will come as finished product, the theoretical portion can be recorded in a file.

Evaluation :

Each individual product should be evaluated separately and continuously. Grades should be awarded, according to CBSE grading system. Gradings for all products and files should be combined to give the final grades.

COMPUTER APPLICATIONS

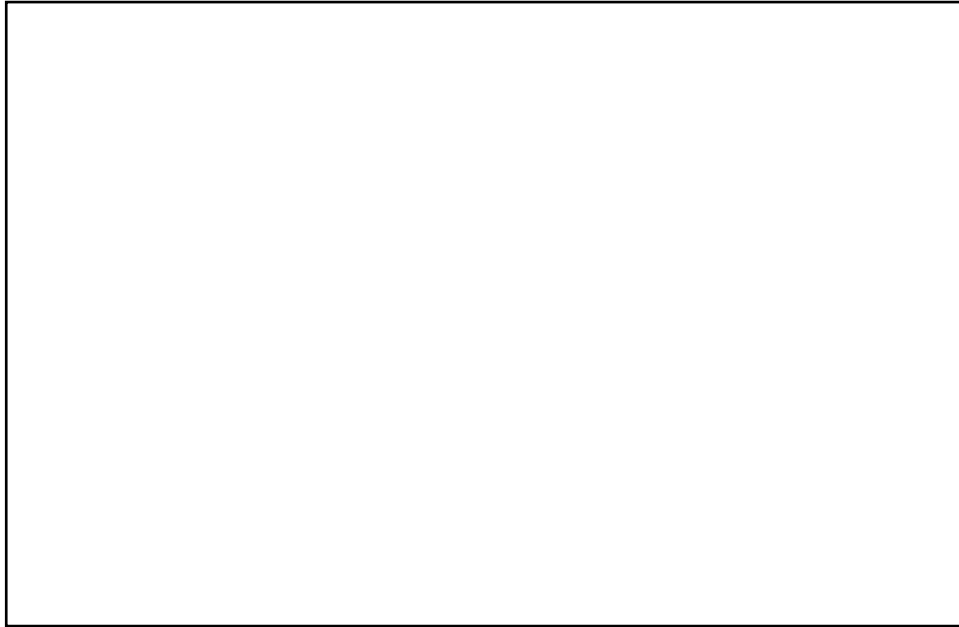


FIG-14

Need of the Community :

Two letter word IT ie. Information Technology has spread its wings in each and every sphere of our lives. It has become utmost important to learn this fast growing technology in order to keep pace with the community.

Learning Outcomes :

The student will be able to;

1. Appreciate the utility of IT in their future professions.
2. Understand the fundamental concepts of IT to face automated environment with confidence.
3. Appreciate the role of computer in daily life.
4. Recognize different parts of computer.
5. Develop the skills to operate keys on keyboard.
6. Familiarize with various commands on computer.
7. Acquire skills to operate on windows

8. Appreciate the use of tool, MS-Word, to assist them in their work, be it writing essays, books, letters, articles etc.
9. Appreciate the concept of electronic data processing. Acquire skills to make use of a very convenient tool MS-Excel, for preparing budget, annual reports, portfolio analysis, production schedule, income statement and scores of other things.
10. Create presentation slides that combine text, charts, graphs, drawings and clip art graphics.
11. Become familiar with database management. A capable Foxpro programmer can solve a wide range of problems in business, finance, administration, science and other areas.
12. Get exposed to the new and important area of emerging technology. The internet create an interest in themselves to utilize their creative powers while implementing the HTML code and thereby create a great website.
13. To understand the application development environment. Use SQL for storing and retrieving data from the RDBMS. Develop ability to arrive at a normalized design of tables and other database objects in RDBMS.
14. Be exposed to the principles of good programming practice as well as the specific rules of C.

Acquire the skills to understand the problem statement and develop logic for problem solving.

The focus is on equipping the student to face the challenges posed by the fast growing information technology environment engulfing the work places, by the time he/she finishes class XII.

DETAILS OF ACTIVITIES (CLASS VI – XII)

Class VI

1. Computer Overview

- Hardware
- Software
- Data
- Information

- Instructions
- Input process – Output cycle
- Input and Output Devices
- Storage devices
- Functional components of a computer
- 2. Introduction To Windows 95/98**
- Menus and Commands
- Opening and closing the application of window
- Managing files and folders
- Familiarization with windows explorer
- Switching between programs
- Familiarization and working with accessories
 - Games
 - Calculator
 - Paint brush
 - Notepad
 - Media player
- 3. An Introduction To MS-Word**
- The word Application and Document Windows
- The basics of entering text
- Editing a document
- Saving a document
- Creating a new document
- Exiting word
- 4. Navigating in word**
- Scrolling and moving through a document.
- 5. Editing text**
- Techniques for selecting text
- Using find and replace
- Moving and copying text
- Using undo and redo features

6. Formatting text

- Applying font styles
- Setting indents, line breaks, paragraph alignment, line spacing, margins.
- Creating headers and footers.

7. Working with tables

- Creating tables
- Enhancing tables

8. Working with graphics

- Inserting, sizing and moving a graphic
- Adding a border to a graphic

9. Proofing Documents

- Checking the spelling of the documents
- Using the thesaurus to find alternative words.
- Checking the grammar and style of your documents.

Class VII

1. Introduction to Operating System
2. Executing some essential internal and external commands of DOS.
3. Implementation of DOS commands on the system.
4. MS-Excel and its features.
5. How to load Excel ?
6. The Workbook
7. The Worksheet
8. **Moving around the workbook**
 - With the Keyboard
 - With the mouse
9. Selecting cells
10. Understanding Ranges
11. Creating a Workbook
12. Editing data
13. Inserting / Deleting Cells, Rows & Columns

14. Saving a Workbook
15. Opening an existing Workbook
16. Exiting Excel
17. Formulae in Excel
18. Using Auto sum
19. **Formatting a Worksheet.**
 - The format menu
 - The formatting toolbar
20. Changing column-widths and row-heights
21. Printing a Workbook
22. **Generating charts / graphics in Excel.**
 - Chart elements
 - Chart types
23. Protecting a Workbook.

Class VIII

1. Starting Power Point
2. **Powerpoint Screen Elements**
 - The main power point window
 - Toolbars
 - The presentation window
3. Power point wizards and templates
4. Opening and closing a presentation file
5. Exiting a power point.
6. Opening new, blank presentation
7. Different types of auto layouts
8. Creating slides and entering text in slide view,
9. Saving a new presentation
10. Spell-checking a presentation
11. Drawing objects and adding clip art on to slides.
12. Working with organization, columns and pie charts

13. Adding transitions and builds to the presentation
14. **Animating the drawing objects**
 - Preset animation
 - Custom animation
15. Running a slide show.

Class IX

1. Introduction To Foxpro

- Introduction to DBMS
- Features of Foxpro
- User interface – catalog manager
 - Menu System
 - Command window
- Database creation
- Adding records
- Opening and closing tables

2. Manipulating Data

- Command syntax
- Operators
- Record pointer
- Viewing the records- List, Display, browse
- Replace command
- Searching for data – Locate, continue
- Delete, pack and recall commands

3. Ordering Records

- Sorting
- Indexing [Advantages]
 - Creating an index
 - Types of indexes
- Sorting v/s indexing

4. Managing Files

- Modifying table structure
- File management
 - Copy, renaming, erasing
- Multiple file handling
- Setting relations

5. Programming In Foxpro

- Foxpro text editor
- Creating a simple program
- Executing and compiling a program
- Memory variables
- Comments in a program
- Input-Output in Foxpro
- Storing values – READ command

6. Creating reports

7. Screen Builder

- Creation
- Generate and execute

8. Designing menus

- Horizontal bar menus
- Components popups

9. Generating table in Foxpro

Class X

1. An introduction to the internet

- History of internet
- Advantages of the internet
- Features of the internet
- India and the internet

2. An introduction to HTML

- Parts of an HTML document
- Steps to create HTML documents
- Making changes in HTML document
- HTML headings
- Usage of various tags
- Adding colour/pictures to HTML documents
- Linking of web pages

3. Tables and Anchors

- Creating a table
- Usage of anchors

4. Forms

- Different interface elements
- Input tag
- Select tag
- Textarea tag

5. Cascading style sheet

- Use of CSS
- 3 ways to add styles to your web pages
- By embedding
- By Linking
- By Inline

6. Cascading style sheet -II

- Colour and background-colour properties
- Working with fonts
- Formatting of text
- Margins, padding and border
- Grouping style sheets
- Assigning classes

7. Introduction to Microsoft front page

Class XI

1. i) Introduction to Databases

- Entity – Relationship Diagram
- Attributes
- Normalization
- Relationship

ii) Keys

- Primary key
- Foreign key
- Candidate key
- Alternate key
- Composite key

iii) Data Integrity

- Entity Integrity
- Domain Integrity
- Referential Integrity
- User-defined Integrity

2. Microsoft Access

- Creating Database
- Creating Table
- Inserting, modifying and deleting data in the table.
- Relating tables
- Enforcing Referential Integrity
- Degree of Relationships

3. SQL Server

- Introduction – What is SQL ?
- Querying Database Tables
- Ordering the results of a Query
- Conditional Retrieval of Rows

- Aggregate Functions
- Grouping the Results of Query

4. Tables and Joins

- Features and designing of SQL Server Tables
- Creating tables
- Applying column constraints
- Inserting values in a table
- Removing a table
- Types of joins – Equi
 - Cartesian
 - Outer

5. Indexes

- Guidelines for creating indexes
- Types of Indexes
 - Clustered Index
 - Non-clustered Index
 - Unique Index
 - Composite Index

6. Introduction to Views

- Creating a view
- Advantages of a view
- Dropping views
- Renaming views
- Maintaining data using views

Class XII (C Language)

1. Fundamentals & Data Types

- The beginning of C
- When and why is C used
- The C program structure

- The C library
- Compiling in C
- Data Types in C
- Identifier Names
- Variables
- Declaring Variables

2. Console Input and Output

- Preprocessor Directives
- Reading / Writing characters
- String I/O operations
- Formatted console I/O
- Print ()
- Scan ()

3. Arithmetic in C

- Assignment Operator
- Multiple Assignments
- Arithmetic Operators
- Binary Operators
- Unary Operators
- Increment and decrement operators
- Arithmetic Expressions
- Precedence of operators
- Relational and logical operators
- The ? operator
- The comma operator

4. Program Control Statements

- Selection constructs
 - If statement and its variants
 - Switch statement
- Iteration Costructs

- For loop and its variants
- While loop
- Do while loop
- Jump Statements
 - Return
 - Goto
 - Break
 - Continue
- Exit () Function

5. Functions

- What functions do
- The function structure
- Arguments of a function
- Return from the function and return from main ()
- Types of a function
- Function declaration
- Function Prototypes
- Variables
 - Local variables
 - Formal parameters
 - Global variables
- Calling the function
 - Call by value
 - Call by reference
- Scope rules for a function
- Recursive functions

6. Arrays

- Defining an Array
- Array Handling in C
- Array Initialisation

- Strings / character arrays
- Two-dimensional arrays
- Initialisation of multi-dimensional arrays
- Arrays as arguments to functions

7. Pointers

- What is a pointer ?
- Why are pointers used ?
- Pointer variables
- The pointer operators
- Assigning values to pointers
- Pointer Arithmetic
- Pointer comparisons
- Pointer as function arguments
- Pointers and strings
- Allocating memory
- Array of pointers
- Pointer arrays for strings
- Multiple indirection
- Pointer to functions

8. Structures

- Definition and declaration of a structure
- Accessing structure elements
- Initialising structures
- Assignment statements used with structures
- Structures within structures
- Passing structures as arguments
- Arrays of structures
- Initialisation of structure arrays
- Pointers to structures
- Structure pointers as arguments

9. Introducing Linked List

- Defining and declaring linked list
- Representing linked lists in memory
- Traversing and searching a linked list
- Insertion and deletion of Nodes from a linked list

10. File Input / Output

- Streams and files
- The ferror () function
- Erasing files
- Flushing streams
- The standard streams
- fread () and fwrite ()
- Command line arguments
- fprintf () and fscanf ()
- Redirection
- Indicating end of file

Suggestive Laboratory Equipment:

1. Computer system
2. Main power supply, UPS/CVT
3. Computer system with windows 95/98/XP
4. Computer system with Disk operating system
5. Input devices – keyboard, mouse, joystick, scanner, light pen
6. Output devices – printer, monitor
7. Storage devices – Floppy disk, CD-Rom, Hard disk
8. System with MS-word, MS-Excel & MS-Power Point
9. System with Foxpro package
10. System equipped with SQL and 'C' languages
11. System with Internet Connection

Qualification of the teacher :

Teacher with a Master's / Bachelor's degree in computer science from a recognized university is most eligible for taking the subject.

Product Outcome :

Students will be able to write their own letters, bio-datas, articles or even books. One can maintain their budgets or report cards can be generated presentation slides can be prepared. Surfing on Internet, Email facility, ecommerce terminology can be explored and upgrade the same.

Record Work :

A proper file should be maintained to record the theoretical details and programs of various problems. The file should contain various flow charts, data flow diagrams, logical deductions wherever required. The software developed can be applied in various areas.

Evaluation :

Software developed by the students should be evaluated based upon the logic used in their programs. Check whether proper indentation and comments have been used. The packages developed are error – free and are user – friendly. Grades may be on a 9 point scale rating as A1, A2, B1, B2, C1, C2, D1, D2, E (as per prescribed CBSE grading system)

Evaluation has to be comprehensive, and dynamic. Final evaluation should be based on both practical grades and file assessment. Cumulative records should be meticulously maintained for all the students.

TYPEWRITING (English/Hindi)



FIG-15

Need of the Community :

Typewriting is an essential skill which should be mastered by everybody. It helps in every walk of life. It increases the efficiency and speed of typing by the user, thereby, accelerating quick completion of any task. It opens various avenues for employment thus increasing their income which leads to the upgradation of the economy.

Learning Outcomes :

The student will be able to :

- Comprehend the use of typewriter and its importance.
- Understand the important mechanism and parts of the typewriter.
- Follow the correct sitting posture while typing.
- Use the correct method of insertion and adjustment of paper in the typewriter.
- Operate the keyboard efficiently and quickly.

- Develop speed and accuracy by practicing daily through manual / electronic / computer.
- Organise and type simple letters, tables and manuscripts.
- Perform stencil cutting and duplicating.
- Maintain the typewriter by regular cleaning and periodical overhauling of the typewriter.

DETAILS OF ACTIVITIES (CLASS IX – X)

Class IX

1. Sitting posture
 - How to place the typewriter on the table.
 - Position of chair and table.
 - Sitting posture of the typist.
2. Simple mechanism of the typewriter
 - Knowing and understanding the overall function.
 - Paper controls
 - Writing devices
 - Inking devices
3. Preparation for typing
 - Insertion of the paper in the typewriter.
 - Adjustment of margins (top, left, right and bottom)
 - Readiness for typewriting.
 - Removal of paper from the typewriter.
4. Keyboard operation
 - Understanding and application of “touch system”.
 - Practising home keys, upper row, bottom row, number row, top row.
 - Practising adjustment keys.
5. Exercise in typewriting.
 - Typing long sentences, simple paragraphs.
 - Typing from simple text.

- Typing from exercises which are graded and counted in striker.
- Typing at slow and moderate speed but with accuracy.

Class X

1. Speed development
 - Typing with speed from running matter.
 - Typing with proper centering, rules of display, syllabification, punctuation marks, etc.
 - Typing from timed exercise.
 - How to calculate speed (running and net speed).
 - Checking of errors before removal of paper from the typewriter.
 - Correction of errors – on single sheets and carbon copies.
2. Carbon man folding :
 - Placing of carbon in between the two papers properly and carefully.
 - Quantity of carbons to be used for a particular number of copies.
 - Using pressure gauge for producing more than three copies.
 - Heavy and light touch, wherever required.
 - Carbon economy
 - Carbon papers (typing)
3. Care and upkeep of the typewriter.
 - Placing the typewriter properly in the centre of the table and covering the same when not in use.
 - Using machine cushion below the typewriter.
 - Regular servicing, oiling, cleaning and periodical overhauling of the typewriter.
 - Keeping the typewriter ribbon on one spool when the typewriter is not to be used for longer duration.
 - Avoiding unnecessary transportation of the typewriter and taking all precautions during transportation.
 - Using backing sheet while typing.

- Ensuring proper mechanical functions of the typewriter.
 - During erasers moving the carriage fully to the left or right so as to avoid falling of eraser-dust into the carriage ways.
4. How to maintain
 - Electronic typewriter and computer.
 5. Stencil cutting and duplicating
 - Knowing about the stencil paper and its guide marks.
 - Insertion and removal of stencil paper and placing of carbon paper for producing additional copy.
 - Cutting the stencil by disengaging the ribbon with the help of Bichrome switch.
 - Correction or errors and use of correcting fluid.
 - Knowing about the duplicating machine and its operation.
 - Observing duplicating process and see how the cyclostyled copies are rolled and taken out of the duplicating machine.

Suggestive Laboratory Equipment :

1. Typewriter (manual / electronic / computer), table, chair, stationery, copy holder / paper weights.
2. A visual chart displaying the parts of the typewriter and functions of the same.
3. Matter to be typed / exercise materials.
4. Typing Software for practice on the computer.
5. A coloured wall chart indicating allotment of keys to various fingers on the keyboard of typewriting machine.
6. A chart indicating all the fingers of both the hands showing allotment of letter to be struck by each finger on the keyboard for all the rows.
7. Exercise Materials (articles from Magazines, Newspapers, etc.)
8. A book of typewriting graded speed passages, Eraser, White correcting fluid, Types, dust removing brush.
9. Carbon paper, pen, Typewriter cover and cushion.
10. Additional typing sheet to be used as backing sheet.

Qualification of the Teacher :

Teacher with a Bachelor's Degree in any stream and a course or a diploma in Typing and Secretarial Practices from a recognized university or polytechnic is most eligible for taking the subject.

Product Outcome :

The timed exercise done by the student will be judged by the teacher. An error free report can be published in the school magazine.

Record Work :

A proper file should be maintained in which all the papers should be filed from the very first day. One can rectify the errors and see the difference in accuracy and speed between the first day and say after 2-3 months. Even the practice papers which may be full of errors should also be enclosed within the file. Time and again the timed exercise should be done from simple text to the running one and the same should be placed in the file.

Evaluation :

Each timed or non-timed exercise should be evaluated there and then. Grades may be allotted to the students based on their speed, accuracy and efficiency. Grades may be on a 9 point scale rating as A1, A2, B1, B2, C1, C2, D1, D2, W (as per prescribed CBSE grading system).

The file may be evaluated side by side with each exercise given. Evaluation has to be continuous, objective based, comprehensive and dynamic. Final evaluation should be based on both practical grades and file assessment. Cumulative records should be maintained meticulously for all the students.

BOOK-KEEPING

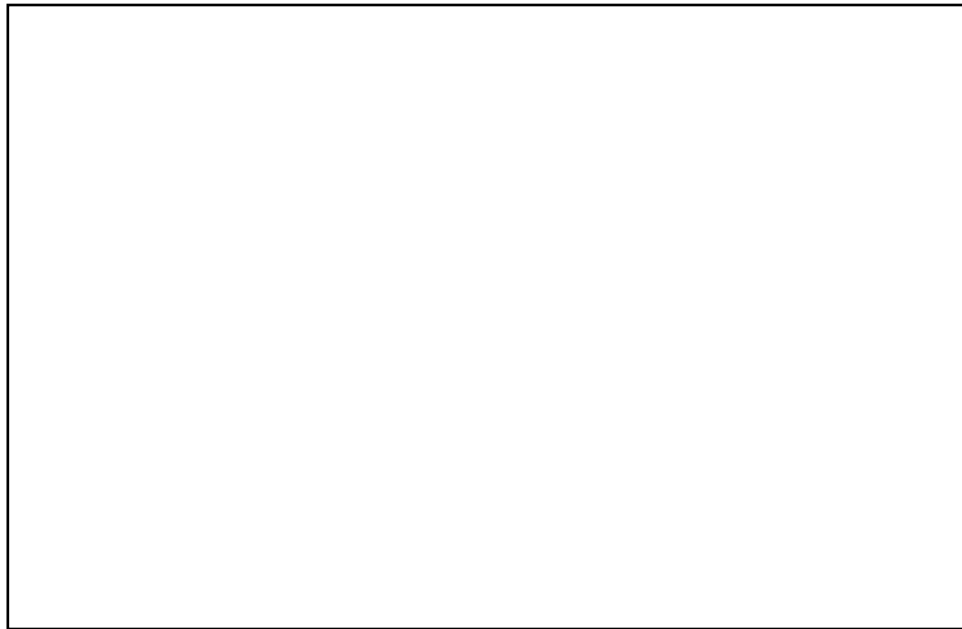


FIG-16

Need of the Community :

In the changing scenario of today's business, one should develop and enhance the features of book-keeping. With liberalization and globalisation bringing sweeping changes in the concept of doing business in the new century, there has been a spurt of activity towards evaluation and validity of goals, concepts and practices both in commercial and professional area.

Learning Outcomes :

The student will be able to :

- Develop an interest in book-keeping.
- Acquire knowledge of the terms, principles and procedures used in book-keeping.
- Apply the principles and procedure of book-keeping in different situations.
- Develop relevant arithmetical and computational skills, and
- Develop the right attitude for clean and attractive work.

- Write cash books and other day books, journals, ledger, etc.
- Prepare trading and profit and loss account.

DETAILS OF ACTIVITIES (CLASS IX – X)

Class IX

1. Explanation of the terms used in Business
 - Business, Transactions, Goods
 - Purchases, sales, purchase returns and sales returns
 - Stock, Assets, Liabilities, Capital
 - Debtors, creditors
 - Account-Current A/c, Savings A/c
2. Maintenance of Cash book
 - Types of transactions recorded
 - Initial documents used as source
 - Recording of discounts
 - Balancing the cash book
3. Handling petty cash
 - Purpose and utility
 - Impress system
 - Petty cash payments
 - Making entries in petty cash book
 - Balancing the petty cash book
4. Transactions related to purchase
 - General procedure for the purchase of goods
 - Requisition
 - Purchase Order
 - Record the goods in the goods received book and stock register.
 - Trade discount
 - Recording the credit purchase in the purchase day book.
 - Payments made

5. Transactions related to Sales
 - Cash and credit sales
 - Invoice, Delivery Note, Trade Discount.
 - Delivery Note
 - Trade discount
 - Recording credit sales in the sales day book
 - Statement of accounts
 - Payment received
 - Issue of receipts
6. Operation of the bank transactions
 - Opening an account
 - Making a deposit
 - Withdrawing of money
 - Making payments through bank cheques and drafts
7. Visit to any nearby bank would create a proper picture of the functioning of a bank.
8. Use of the following office equipment
 - Calculator, Date Stamp, ready reckoner
 - Punching machine, Stapling machine
 - Typewriter, Computer

Class X

1. Recording of financial transactions in basic books of accounts
 - Journal
 - Journal paper
 - Recording different types of transactions in journal paper
 - Debit post and credit post of transactions
 - Writing narration
2. Recording in subsidiary books
 - Purchase day book, Purchase Return book
 - Sales day book, Sales returns book
 - Bills receivable book, Bills payable book

3. Posting of transactions in ledger accounts from subsidiary books
 - Posting from purchases book, purchases returns book
 - Posting from purchases sales book, purchases sales returns book
 - Posting from purchases cash book
4. Balancing the ledger accounts
 - Account
 - Kinds of accounts
 - Balancing personal, real and nominal accounts
5. Preparation of trial balance
 - Meaning of trial balance
 - Methods for preparing trial balance
 - a. Total method
 - b. Balance method
 - Steps to be taken if trial balance does not agree.
 - Is trial balance a conclusive proof of the accuracy of the work of book keeper.
 - Errors disclosed in Trial Balance.
6. Preparation of Trading and Profit and Loss Account
 - Item to be included in trading account.
 - Item to be included in profit and loss account.
7. Creation of a Budget for home/office/shop would help in understanding the concept of book-keeping.

Suggestive Laboratory Equipment :

1. Black-board, chalks and charts, computer.
2. Receipts, Cash book
3. Stock record cards, Requisition slips, Purchase order forms, Stock register, Purchase day book.
4. Performa of invoice, Receipts, Delivery note.
5. Application form for opening the account, Pay-in-slip, Cheques, Drafts, Pass book.

6. Date stamp, Calculator, Ready reckoner, Type-writer, Punching machine, Stapling machine, Computer.
7. Journal proper book, Vouchers
8. Vouchers, Subsidiary books, Purchases book, Purchase returns book, Sales book, Sales returns book, Bills receivable book, Bills payable book.
9. Ledgers
10. Ledger book with recorded accounts.
11. Outline charts of trial balance and trading and profit and loss account.

Qualification of the Teacher :

Teacher with a Master's / Bachelor's degree in Commerce from a recognized university is most eligible for taking the subject.

Product Outcome :

A student can maintain his home/office budget in a rational manner. One can understand the functioning of various financial institutions like banks, post office, etc. and thus operate comfortably.

Record Work :

A proper Book keeping file should be maintained in which the revenue and expenditure related matters should be maintained either weekly or monthly. The student can try hands on the computer with the help of Tally accounting package. A report of some company can be made which could include the trial balance, profit and loss statement, balance sheet and various other documents. The same can be handed over to the company for a price.

Evaluation :

The report should be evaluated there and then. Grades may be allotted to the students based on their report. Grades may be on a 9 point scale rating as A1, A2, B1, B2, C1, C2, D1, D2, W (as per prescribed CBSE grading system).

The file may be evaluated side by side. Evaluation has to be continuous, rational, objective-based comprehensive and dynamic. Final evaluation should be based on both final report and file assessment. Cumulative records should be maintained meticulously for all the students.

OFFICE ROUTINE AND PRACTICES



FIG-17

Need of the Community :

For any business to be a success, the working atmosphere and ambience of the office should be upto the mark. Services rendered should be upgraded and carried out with full caution for the satisfaction of the customer. In this manner, the productivity chart of any business can rise and be fruitful for the same.

Learning Outcomes :

The student will be able to,

1. Set the environment and ambience according to the need of the office.
2. Identify various records kept in the office.
3. Recognise the items displayed and the procedure followed.
4. Deposit and withdraw money from bank account.
5. Distinguish inward and outward mail, inland and foreign mail etc.
6. Use office tools and equipment.
7. Maintain personal files, office files and its indexing.
8. Use office machines, including computer.

DETAILS OF ACTIVITIES (CLASS IX – X)

Class IX

1. **General awareness about the office and business environment.**
 - i. Educational institutions and services.
 - a) Types of records viz., students, teachers, administrative staff.
 - b) Assembling, punching and stapling of office papers, records, receipts etc.
 - c) Filing of papers on day-to-day, weekly, monthly, or yearly basis.
 - d) Need and importance of records. Arrange the records according to the priority. Maintain the records in order i.e., arrange them year-wise or name-wise accordingly.
 - e) To know the procedural aspects, norms and regulations and familiarity with office personnel, environment etc.

The above mentioned criteria stands true for various other organizations as well. Eg. Clinics, hospitals, nursing homes charitable trusts and welfare organizations, health clubs / fitness centres, etc.

- ii. Offices which maintain stock -
 - Kinds of goods
 - Modes of display
 - Sales procedure
 - Warehouse facilities provided
 - Re-order level gauge
 - Upgradation of the stock with latest products.

Some examples of business / offices which come under this criteria are –

- a) Electronic or electrical goods
- b) Furniture shop
- c) Automobile
- d) Export House
- e) Cellular Phones
- f) Computers – Hardware, stationery etc.
- g) Fabric shops
- h) Packaging job work
- i) Departmental stores (perishable / non perishable goods).

- iii. Financial Institutions like BANK
 - a) Nature and services rendered by the bank.
 - b) Deposits, withdrawals, loans
 - c) Ancillary services (including latest services like ATM, credit cards, debit cards, smart cards, etc.)
- iv. Services rendered by various agencies and consultants :
 - a) Nature of services to be given
 - b) Who is the target ? To whom the services have to be rendered ?
 - c) Surveys and investigations to be conducted.
 - d) Techniques and innovative ideas to be inculcated in the profession.
 - e) Availability of the personnel round the clock and awareness of latest market trends.

2. Handling of Mail :

- i. Inward and outward mail :
 - a) Unrecorded delivery eg. Post card, inland, aerogramme, envelope etc.
 - b) Recorded delivery eg. Registered letters, under certificate of posting, book post etc.
 - c) Centralised and decentralized correspondence.
- ii. Mail register (inward and outward)
 - a) Receipt Register
 - b) Despatch Register
 - c) Peon book
 - d) Envelopes
- iii. Postal communication through latest techniques:
 - a) Telegram, Phonogram
 - b) Money order and postal order
 - c) Telex and fax
 - d) E-mail facility through internet
 - e) Video conferencing and news

Class X

1. Office Equipment and tools :

- i. Purchasing and stapling machines
 - a) Single Punch Machine
 - b) Double Punch Machine
 - c) Stapler, stapling pins, Pokers, Tags
 - d) All pins and clips
- ii. Operation of typewriting machine
 - a) Electric Typewriter
 - b) Electronic Typewriter
 - c) Manual Typewriter
- iii. Operation of Addressing Machines – Franking Machines
- iv. Operation of Multi Copying Machines
 - a) Duplicating Machines
 - b) Photocopier
- v. Operation of Communication Equipment
 - a) Ordinary
 - b) EPABX / PBX System
 - c) Mobile Phone
- vi. Use of filing equipment
 - a) Filing cabinets
 - b) File Covers
 - c) Tags / filing clips
- vii. Computing Machines
 - a) Adding and listing machines
 - b) Calculators
 - c) Computers
- viii. Communication Machines
 - a) Fax (ordinary / through computer)
 - b) E-mail

2. Office services

- i. Record Keeping
 - a) Filing
 - b) Indexing
- ii. Typing services (Manual / electronic / computer)
 - a) Typing sample matters
 - b) Typing from manuscripts
 - c) Typing of tabulation
 - d) Typing simple letters
 - e) Stencilling
- iii. Reprographic Services
 - a) Preparing multiple copies of letters, circulars, documents etc.
 - b) Duplicating
 - c) Carbon Copying
 - d) Photocopying
- iv. Telephone handling
 - a) Receiving calls
 - b) Answering calls
 - c) Recording message
 - d) Placing calls

Suggestive Laboratory Equipment :

Different Types of Files, Punching and stapling machine, cash memos, packaging materials, different bank forms, post cards, stamps, envelopes, inland letters, diary register, despatch register, Peon book, telegram form, telephone, telephone directory, mobile phone, manual / electric / electronic typewriter, franking machine, duplicating machine, photocopier, EPABX / PBX Systems, computer, calculator, fax machine, filing cabinet, files, tags, papers, clips, etc.

Qualification of the Teacher :

Teacher with a Bachelor's Degree in any stream (if possible, B.Com. – Hons.) Clubbed with MBA i.e., Master's in business administration degree or Diploma in Business manager from a recognized university is eligible for taking the subject.

Product Outcome :

One can setup the office with all requisite equipments and facilities thereby creating an ambience in the work place. Handling of all types of transactions can be done with ease. Management of personnel at all levels is done with full efficiency and dynamism.

Record Work :

A proper file should be maintained to cover the details of each type of office set up. The file should be supported with suitable pictures and illustrations.

Evaluation :

The practical file can be evaluated and grading done as per CBSE grading system. Student's overall performance in the class should be observed and grades allotted according to their caliber and work output.

REPAIR AND MAINTENANCE OF ELECTRICAL GADGETS

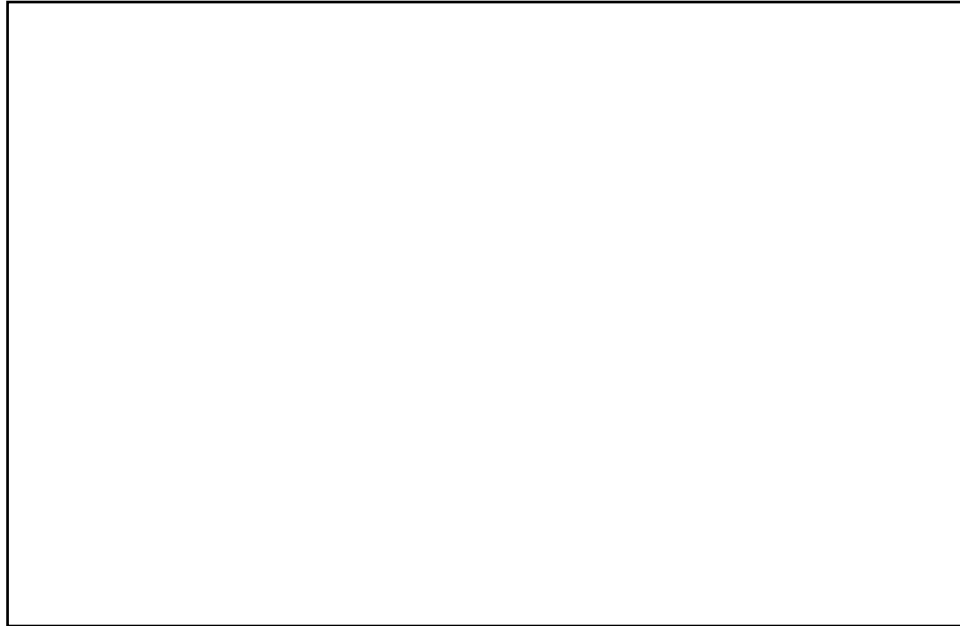


FIG-18

Need of the Community :

Every modern house is equipped with a number of electrical devices which need proper repair and maintenance. Learning how to repair these electrical gadgets is very useful in our real life situations. It would make our day to day life easier as if during odd hours, some fault takes place in any household electrical device and there is no chance of calling the electrician / technician, then this repairing can be done by the grown up child who has undergone this course.

Being equipped with this knowledge, one can easily cope up with the changing demands of the society. Developing the practical skills will help the students to cope up with professional courses to be chosen as a career ahead. This course helps to develop an understanding of the need and necessity of domestic appliances; and how to maintain them.

Learning Outcomes :

The student will be able to ;

1. Develop practical skills, problem solving skills, experimental skills in him.
2. Get exposed to different processes / methods used in electrical / electronic devices.
3. Develop creative thinking for preparing new electrical devices.
4. Dismantle and assemble electrical / electronic devices.
5. Locate faults in these devices and repair them.
6. Understand the basic electrical quantities.
7. Recall safety precautions during electrical operations.
8. Rewire the fuse.
9. Understand the principles of functioning of electrical appliances.
10. Measure various electrical quantities.

DETAILS OF ACTIVITIES (CLASS IX – XII)

Class IX

1. To identify the electrical accessories from demonstration board and know the applications.
2. To study the sign and symbol of electrical gadgets and accessories.
3. Definitions of basic electrical quantity - Electricity, charge, current, voltage, resistance and power – formulae and calculations using simple circuits.
4. Introduction to Hand-tools, their care and maintenance.
5. Presentation and treatment of shock – cause and effect. To perform an exercise on artificial respiration. To remove person from electrical contact.
6. Definition of A.C. and D.C. - Similarities and dissimilarities. Identification of A.C. and D.C. supply –
 - a. Observation Test
 - b. Neon Test

- c. Using ammeter
7. Description of domestic electric supply – Its specification voltage, current, capacity, number of wires, number of phases, frequency.
8. Heating effect of current – Its formula and demonstration, calculation of electricity energy consumption and commercial unit of energy, idea of electricity bill.
9. Identification of different feeding wires in domestic supply – significance of earthing and its system, testing of earth connection in socket.
10. Construction of a test lamp and heater / electric iron cord, using earthing.
11. Testing of simple appliances – Heater, Non-auto iron, Non-auto oven, Non-auto toaster.
12. To dismantle and assemble the following electrical accessories – bed switch, push button switch, batten holder, angle holder, 3 pin plug, two / three pin socket.
13. Different types of Circuits – Open and closed, normal and short resistance of various types of circuits.
14. Series testing board – Working, use and construction.

Class X

1. Introduction, use, type (based on working / construction) connections of – Amperemeter, voltmeter and wattmeter.
2. Making a simple moving coil ammeter, locating and repairing faults.
3. Fuse Wire – selection, type, testing whether the fuse is 'in' or blown, replacement of fuse wire.
4.
 - a. Introduction to multimeter and method of its uses.
 - b. Testing of electrical appliances using multimeter.
5. Principle of fault location and demonstration using multimeter.
6. To dismantle and assemble the electrical appliances - Heater, kettle, immersion rod, hot plate, toaster, electric iron, geyser.
7. To find the fault in above electrical appliances and rectify them.
8. Construction of simple electric motor to run a fan.

9. Make a switch board for one room set consisting of four points – Bulb, tube-light, ceiling fan and socket on the board.
10. Arrangement of bulbs for a decorative series used in festivals.
11. Making of electrical bell and buzzer.

Class XI

1. Plan a layout of Main-board for domestic supply – Drawing connection diagram, tracing connections.
2. Draw a wiring diagram of a 2 room set consisting of four points – Bulb, tube light, ceiling fan and three pin plug. Make a switch board.
3. Fault location and repair of electrical appliances like electric kettle, room heater, bell, mosquito repellent, aquaguard water purifier, heat cooler, regulator of fan, electric iron, toaster, hot plate, heat convector.
4. Study of fluorescent tube light –
 - a. Working principle, components and circuit diagram.
 - b. Tracing the circuit.
 - c. Functions of choke.
5. Series and parallel connection of electrical components.
 - a. Method of series and parallel connection – Properties and formulas.
 - b. Practical – Making series – parallel connection of three components and verifying properties.
6. Charging and discharging of cells – Batteries of inverters and cars – their working principle and maintenance.
7. Study of Meggar (Insulation Tester)
 - a. Principle of working and use.
 - b. Practical – Earth and leakage test using Meggar.
8. Study of single phase transformer – working principle, types, material used, construction, testing and specifications.
9. Study of Manual Voltage Stabilizer –
 - a. Principle of working, circuit diagram.
 - b. Practical – Tracing the connection, testing and application.

Class XII

1. To test whether the supply is A.C. or D.C. – Principle of testing and circuits.
Practical – To test the supply if A.C. / D.C.
2. Conversion of A.C. into D.C. – Concept of rectification. Half wave and full wave rectifiers with filter circuits.
Practical – Assembling of an eliminator.
3. Electrical Motors -
 - a. What is a motor. P, basic principle, working, general construction.
 - b. Types of motors – A.C. / D.C.
 - c. Types of A.C. motors – Induction / Series motor (Universal).
 - d. Faults and testing of motors.
 - e. Minor repairing of a motor.
4. To study construction, testing, dismantling and reassembling of the following appliances having Induction motor –
 - a. Table fan
 - b. Ceiling fan
 - c. Exhaust fan
 - d. Room cooler
 - e. Heat convector
5. To study the construction, testing, dismantling and reassembling of following appliances having D.C motors / Universal motors.
 - a. Tape recorder
 - b. Hair Dryer
 - c. Hand mixer grinder
 - d. Food processor
6. Working, principle of fans, regulator.
Practical – To study parts of fans and regulator, testing and repairs.
7. To study the construction, testing, dismantling and reassembling of following appliances having A.C. series motor -
 - a. Cooler pump (shaded pole)

- b. Booster pump (induction type)
8. To study the construction, working and maintenance of heat pumps (Air conditioner / Refrigerator)
9. Elementary idea about A.C. generator – Distribution of electrical energy, transmission at high voltage, energy losses during transmission.
10. Outline the principles of working of Washing Machine and locating faults.
11. Microwave – Outline the working principle and maintenance of a microwave.

Suggestive Laboratory Equipment :

Electrical appliances, wires, holders, voltmeter, ammeter, solar cells, soldering machine, three pin socket, fuse, fuse wire, battery, screw driver, voltage stabilizer, transformer, resistors, dry cells, rheostat, key.

Different activities need specific electronic gadgets which is left to the discretion of the teacher.

Qualification of the teacher :

Teacher with a B.Sc. (Hons.) in Electronics or B.Sc. with Electronics as a subject or an equivalent Diploma from a recognised University or Institute is eligible for taking the subject.

Product Outcome :

The students will prepare certain electrical devices like electric bell, simple switch board etc. They will also repair a variety of different products.

Record Work :

The students should prepare an activity file to record the procedures and circuit diagrams. A project file on a related topic may also be prepared.

Evaluation :

The different electrical devices repaired or prepared should be assessed minutely for their working efficiency and use. Grades should be allotted to the students as per CBSE guidelines. The activity file and project file should be assessed from time to time and grading done. Final grading term wise should be based on the files and electrical devices repaired / prepared.

REPAIR AND MAINTENANCE OF SIMPLE ELECTRONIC DEVICES

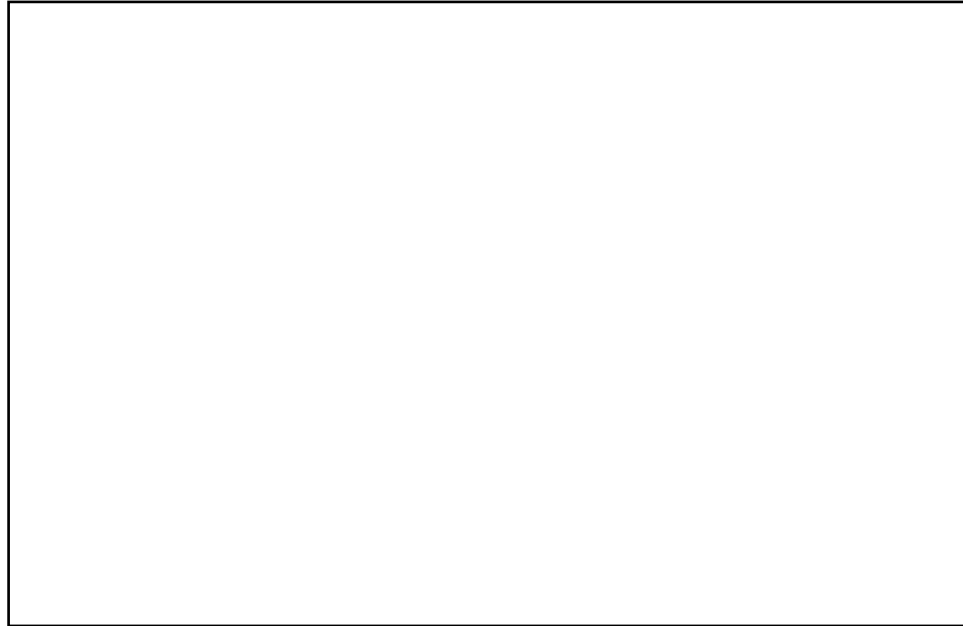


FIG-19

Need of the Community :

With the advancement of science and technology we are using more and more electronic devices which need repair as well as maintenance. Work Education must give this area of activity to students so that they can develop their interest and creativity. The knowledge in this area is of great use not only for home and family but for career also if students link it up further in their education.

Learning Outcomes :

The student will be able to ;

1. Develop practical skills in repairing, maintaining and making electronic devices used in day to day life.
2. Develop problem solving skills related to electronic devices.
3. Develop creative thinking in the area of electronics.
4. Develop understanding of basic electrical science.
5. Identify and test electronic components.
6. Measure electrical quantities.
7. Develop skill of soldering to construct electronic devices.

8. Locate fault of electronic devices by various methods i.e.
 - i. Testing individual components
 - ii. By signal flow method
 - iii. By measuring voltages at testing points
 - iv. Install and use P.A. system.

DETAILS OF ACTIVITIES (Class IX –XII)

Class IX

1. Hand Tools :- their nomenclature and proper use.
eg: screw driver, cutter etc.
2. Distinguish between A.C. and D.C.-Identification of A.C. and D.C. supply, simple experiment to measure A.C. voltage and current through a coil.
3. Use of Multimeter (Analogue and Digital) to measure voltage (A.C/D.C), current (A.C/D.C) and resistance.
4. Colour code for resistance and capacitors.
5. Study of electronic components-sign and symbols recognition, specification and testing of components like resistors, capacitors coil, diode, transistor, zener diode, photo diode, LED, solar cell, P.C. Board, I.C. (Integrated circuits) using multimeter.
6. Working principle, use, specification and testing method for microphone, loud speaker etc.
7. Soldering – Principle, method and materials.
Practice of soldering.
8. Assembling of extension board using 3-pin socket and fuse.
9. Safety precautions during electronic works – devices used for personal safety, shock treatment. Rescue and first aid.
10. Significance of earthing in electronic circuits, recognition of live and neutral wire.
11. Construction of 8 L.E.D. disco light (Draw circuit diagram)
12. Testing of disco light checking individual components.
13. Construction of battery eliminator. (using half wave/full wave circuit diagram) (draw circuit diagram).
14. Testing of battery eliminator, checking individual components.
15. Simple construction of fire alarm (using photocell).

Class X

1. Series and parallel connection of electronic components. Method of connection, use, formulae [Practical- To connect atleast three components in parallel/series and mixed group –measuring voltages across each.

2. Construction, working principle of A.C. and D.C. ampere meter, voltmeter.
3. Outline principle of transistor as an amplifier and oscillator (common base/common emitter circuits). Calculation of voltage and power gain for an amplifier.
4. Construction of audio amplifier.
5. Construction of oscillator.
6. Construction of Musical bell.
7. Construction of Simple emergency light.
8. Testing of musical bell, emergency light, amplifier and oscillator by measuring voltages.
9. Construction of light operated switch.
10. Construction of sound operated switch.
11. Construction of touch operated switch.
12. Methods for fault finding of above devices and their verification.
13. Calculation of L,C,R & Z of a coil at light frequency using A.C. voltmeter and ammeter.
14. PAS (Public Address System)-
 - (a) Components of PAS and their specification.
 - (b) Demonstration – Installation
 - (c) Connectors used with microphones
 - (d) Impedance matching calculations for speaker.
 - (e) Locating and repairing of minor faults in PAS
15. Tuning circuit of TV, Transistor and Radio-variable, capacitor and inductor. Idea of resonant frequency.

Class XI

1. Concept of block diagram – drawing simple block diagrams of power amplifiers (audio), radio, amplifiers, oscillators, tape recorder.
2. Integrated circuits fabrication – Advantages and limitations (I.C)
3. Feedback circuits – Classification of oscillator on the basis of feed back.
4. To study the effect of positive and negative feedback on the performance of an audio amplifier.
5. Assembling of 3-stage audio power amplifier.
6. Assembly of 3-stage I.C. based power amplifier.

7. Assembly of 3-stage tape recorder plate.
8. Testing fault location and repair of above devices.
9. Locating the fault in mechanical system of tape recorder and rectification.
10. To check the motor, change the belt, clean/change pinch-roller of tape recorder.
11. Check and change the head of tape recorder.
12. Assembling dimmer using SCR.
 - i. Working principle and circuit diagram.
 - ii. To construct a dimmer.
13. Assembling Electronic emergency light-
 - i. Working principle and circuit
 - ii. To construct emergency light
14. Single phase transformer:
 - i. Working principle, types, materials used, connections testing and specifications.
 - ii. Construction of various types of transformers.

Class XII

1. Manual voltage stabilizer – Working principle, circuit tracing, connection and testing, repairing.
2. Automatic voltage stabilizer- Working principle, circuit tracing, connection and testing, repairing.
3. Communication – Line-space and optical. Outline principle including type of transmitters, receivers and communication channel.
4. Understanding of the principle, construction of twisted pair of wires, coaxial cable wire, optical fibre.
5. Designing of simple laser diode (Pencil beam/torch).
6. Working of fax, modem- Connections, testing and repairing.
7. Assembling the Transistor receiver-
 - a. Description of circuit of transistor plate.
 - b. Assembling the output stage.
 - c. Assembling the I.F. stage.
 - d. Assembling the mixer stage
 - e. Alignment
8. To locate faults in Transistor receiver circuit.

9. Principle of Black and White/Colour television: C.R.T. concept of scanning, formation of picture, synchronization. Block diagram of Television. Preparing individual charts.
10. Principle and method of tuning of T.V. receiver (B/W, colour).
11. Tuning and adjustment of T.V.
12. Installation of T.V. antenna :- Dipole, dish difference in transmitting and receiving antenna in terms of action and efficiency.
13. Telephone – Locating fault, socket connections, working principles.

Laboratory equipment required ;

Chart of symbols and units, colour charts. Demonstration board containing various accessories, voltmeter, battery/cell wires, digital multimeter, connecting wires, resistance of assorted values and other passive components. e.g. resistor, capacitor, inductors, active components, tube devices, semi conductors, soldering iron, soldering wire, flux, cutter, sand paper, PCB, tools, ammeter, voltmeter, dry cells, power supply, rheostat , connecting wire, amplifier, transformer, spares of transformer tools, all electronic devices which are taken in the activity.

Qualification of the teacher :

Teacher with a B.Sc (Hons) in Electronics or B.Sc with Electronics as a subject or an equivalent Diploma from a recognized university or institute is eligible.

Product outcome:

Repaired electronic devices and record file will be produced. Other electronic devices will be made in the class.

Record work :

A proper file should be maintained to record circuits, diagrams and experiments. The entire theoretical aspects of electronic devices studied should be recorded.

Evaluation :

The electronic devices file should be evaluated from time to time and grading done as per CBSE grading system. The working efficiency of the student in the laboratory should also be assessed and grading done. Final evaluation should be on the overall working and file work.

GARDENING AND VERMICOMPOSTING

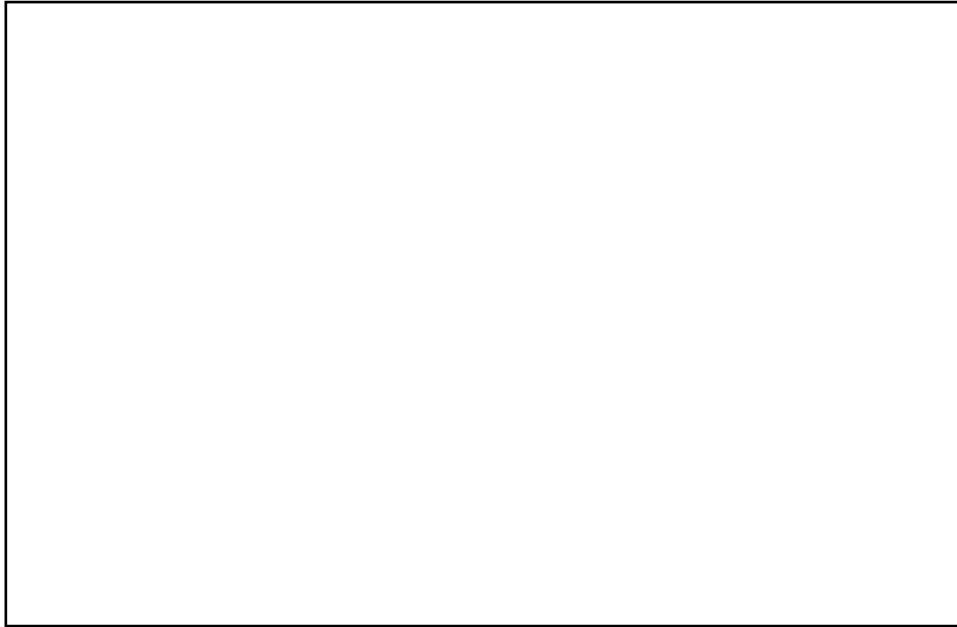


FIG-20

Need of the Community :

Human civilization has disturbed the ecological balance so much that there is a need to inculcate habits of gardening among students which can help them in not only maintaining the landscaping for the beauty of their house, but school and community gardens also. Students will learn to appreciate nature by taking up this activity. Maintaining a kitchen garden is a very good physical exercise and hobby as well as a source of entertainment also. Hence, taking up this activity will be the accomplishment of the goals of work education in true sense.

Waste Management is a crucial problem in India. Organic waste which is biodegradable can easily be used for Vermicomposting which can be further used for the purpose of gardening and agriculture. Household waste can be easily managed by this process.

Learning Outcomes :

The student will be able to,

1. Identify different tools and implements used in gardening and their use.

2. Develop skill for selection of materials for pot filling and seed sowing.
3. Develop attitude regarding economic use of water while irrigating plants.
4. Identify common plants in the garden.
5. Explain the utility of preparing a good nursery-bed, seed bed.
6. Plan planting of hedge.
7. Identify shrubs and ornamental trees.
8. Propagate the plants by cutting, grafting, layering, bud-grafting and by using bulbs.
9. Identify the different types of organic manures.
10. Develop skills for the selection, procurement and arrangement of saplings and materials for different forms of production work.
11. Recall the habitat and habits of earthworms.
12. Recall the growth requirements and feeding habits of earthworms.
13. Select suitable species of earthworms for vermicompost preparation.
14. Select the materials used for preparation of vermicompost.
15. Prepare, pack and store vermicompost.
16. Apply vermicompost in nursery and orchards.
17. Appreciate the dignity of labour.

DETAILS OF ACTIVITIES (CLASS VI – XII)

Class VI

1. Identification of different digging implements and to find out their uses.
2. Identification of watering can and its application.
3. Handling and care of tools and implements.
4. Pot filling.
5. Sowing of seeds of seasonal flowers in pots.
6. Watering of pots, seed beds and garden.
7. Identification of common plants.
8. Identification of seeds of common flowering, ornamental and garden plants.
9. Prepare a scrap book on Agricultural tools and implements.

Class VII

1. Identification of cutting implements.
2. Depotting and repotting of plants.
3. Preparation of seed beds and flower beds.
4. Sowing of seeds in beds.
5. Watering of pots, seedbeds and garden.
6. Visit a garden with the teacher for an introduction to plants.

Class VIII

1. Identification of spraying and dusting machines.
2. Handling and care of tools and implements.
3. Sowing of seeds in pot and bed.
4. Sowing of seeds in nursery beds for transplantation.
5. Transplantation of seedlings.
6. Weeding and thinning by khurpi.
7. Watering of pots and garden.
8. Watering of seed beds.
9. Identification of herbs, shrubs and trees.
10. Prepare a scrap book on locally available herbs, flowering plants, leaves. (Herbarium)

Class IX

1. Identification of seasonal flowers and seeds of seasonal flowers.
2. Raising of seedlings from seeds of seasonal flowers in the nursery beds/pots.
3. Weeding of lawn.
4. Manuring of lawn.
5. Mowing or cutting of lawn.
6. Making of hedge and edge.
7. Write a report on T.V. and Radio programmes related to Agriculture or Gardening.

8. **Vermicomposting**

- a. Study of habitat and habit of earthworms.
- b. Study of cocoon.
- c. Selection of earthworm for vermiculture and vermicompost preparation.
- d. Selection of waste materials for vermicompost preparation.

Class X

1. Identification of shrubs and ornamental trees.
2. Propagation of plants by cutting and layering.
3. Identification of organic manure.
4. Layout and preparation of lawns.
5. Plantation of saplings.
6. Preparation of a record having either pictures or samples (their leaves, branches, flowers, seeds) of shrubs and ornamental trees.

7. **Vermicomposting**

- a. Cultivation of earthworms on waste materials.
- b. Preparation of vermicompost.
- c. Pack and store vermicompost.
- d. Apply vermicompost in pests, nursery and orchards.

Class XI

1. Identification of climbers and creepers.
2. Propagation of plants by grafting and by bulbs.
3. Identification and application of different fertilizers.
4. Layout and development of a kitchen garden.
5. Pruning and trimming of hedges, edges and borders.
6. Use of insecticides and pesticides.
7. Plantation of sapling.
8. Visit a kitchen garden and report.
9. Visit a Nursery and report.

Class XII

1. Identification of orchids, fern, cactus and ornamental foliage.
2. Propagation of plants by budding.
3. Identification and application of fertilizers.
4. Maintenance of kitchen garden.
5. Pruning and training of fruit trees and ornamental trees.
6. Identification and use of pesticides.
7. Plantation of sapling.
8. Visit a botanical garden and report its different components in details.

Suggestive Laboratory Equipment:

Different plants, their seeds, saplings. Agricultural tools and implements, measuring tape, polythene sheet, scissors, watering can, pruning knife, chemical fertilizers, pots, bucket, hose pipe, manures, measuring containers, insecticides, pesticides.

Qualification of the Teacher :

Teacher with a Master's / Bachelor's Degree in Biology from a recognized university is most eligible for taking the subject.

Product Outcome :

Some plants will be grown in the pots and garden of the school. All the activities may be taken up in groups.

Record Work :

A proper file should be maintained with drawing sheets and ruled sheets. All experiments should be recorded on sheets and supported by relevant drawings. Scrap books / Herbarium should be prepared wherever mentioned.

Evaluation :

The record file and scrap book / herbarium should be graded as per CBSE grading system. The students should be awarded grades based on their files and involvement in the field practicals.



Fig : 1



Fig : 2



Fig : 3



Fig : 4



Fig : 5



Fig : 6

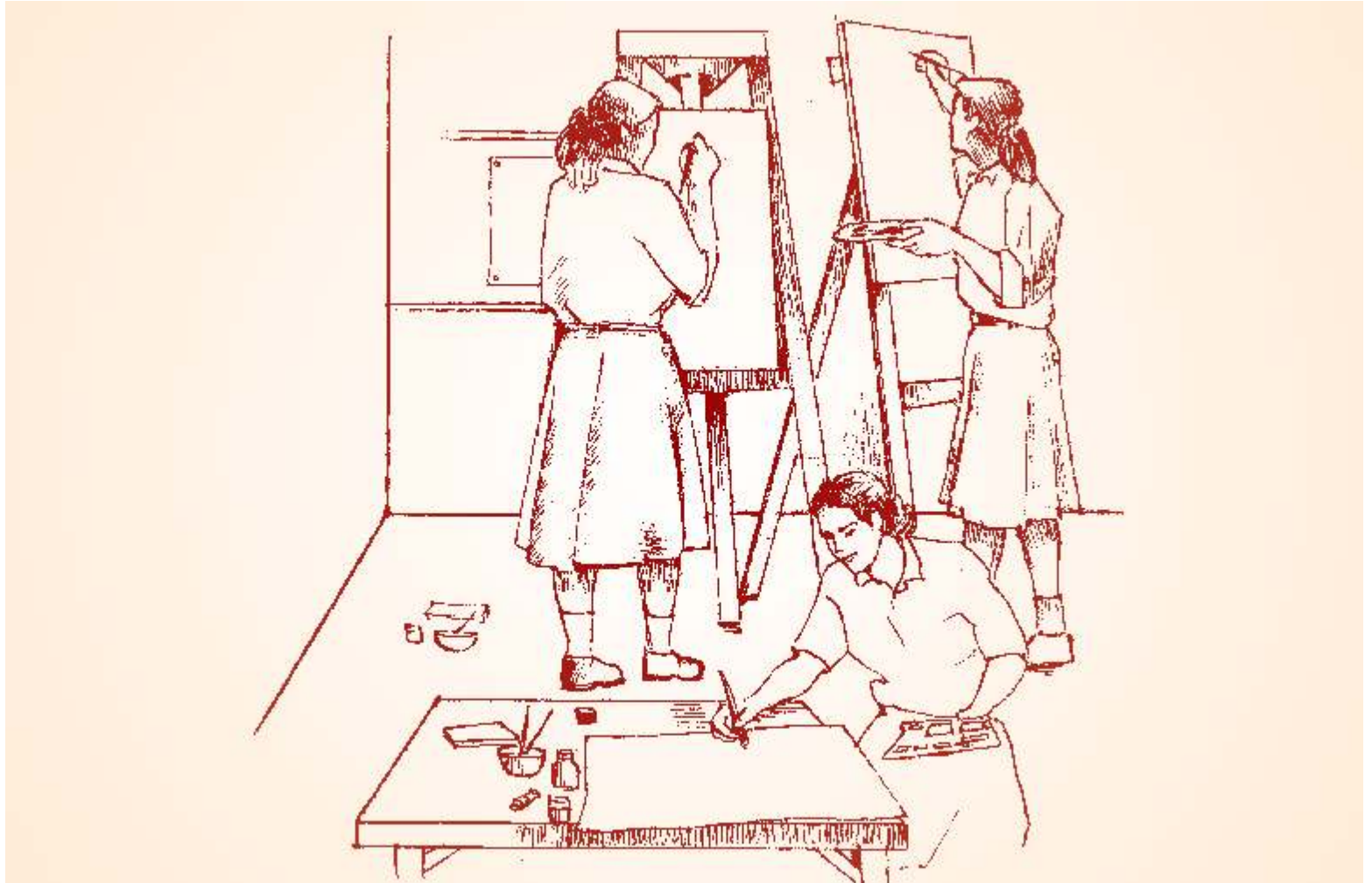


Fig : 7



Fig : 8

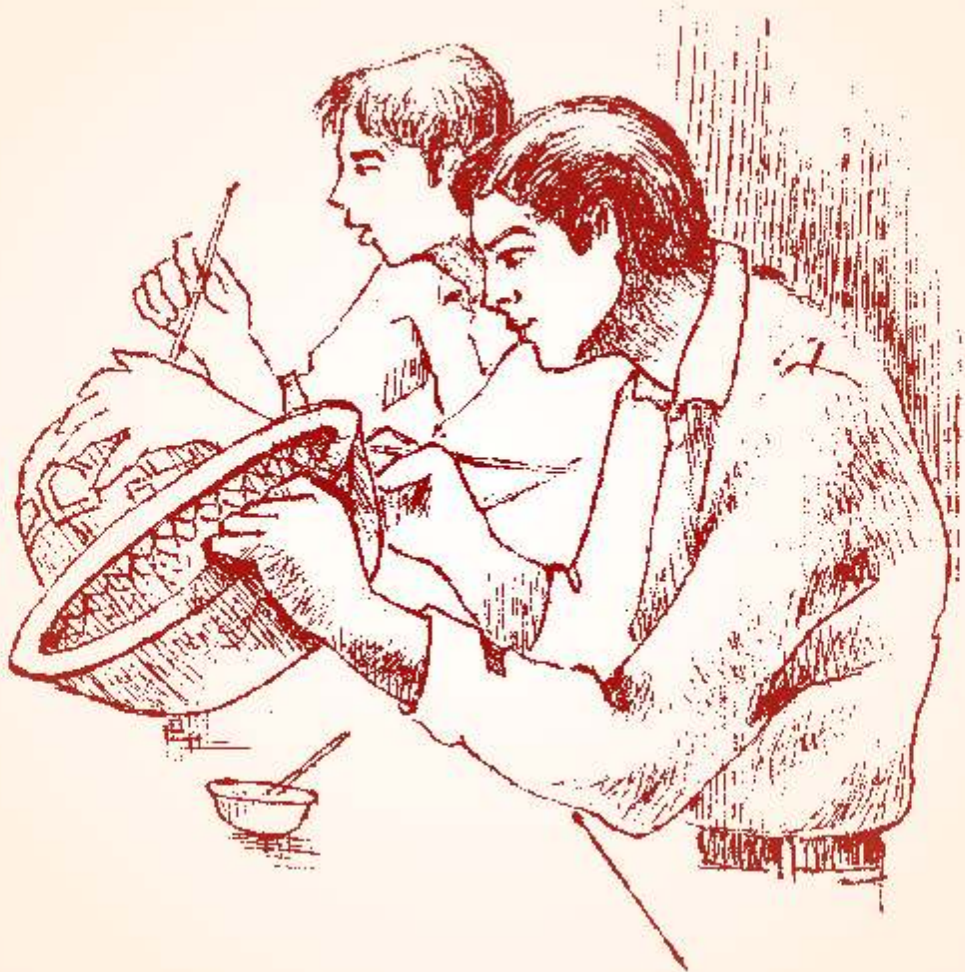


Fig : 9



Fig : 10

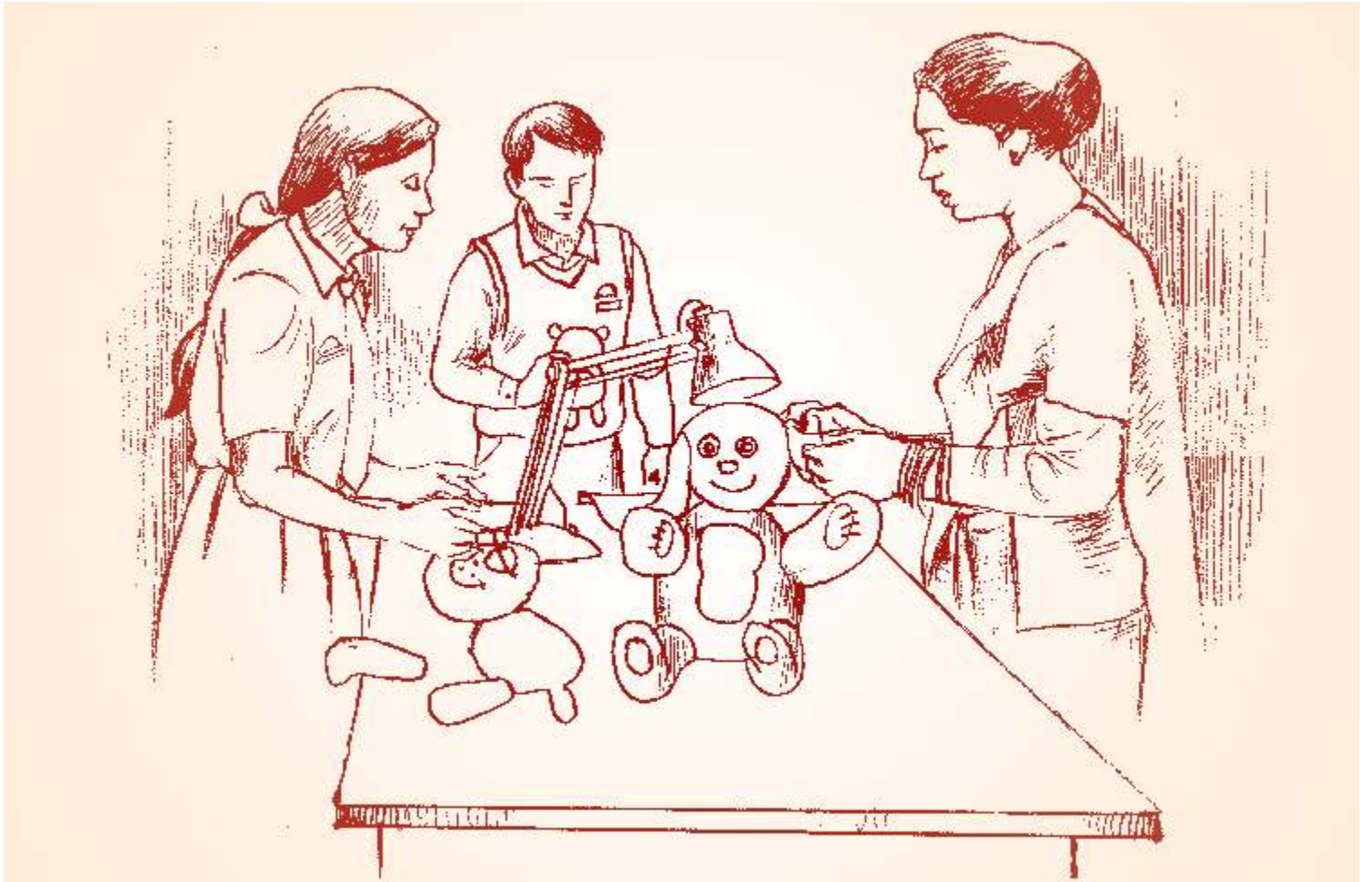


Fig : 11



Fig : 12



Fig : 13

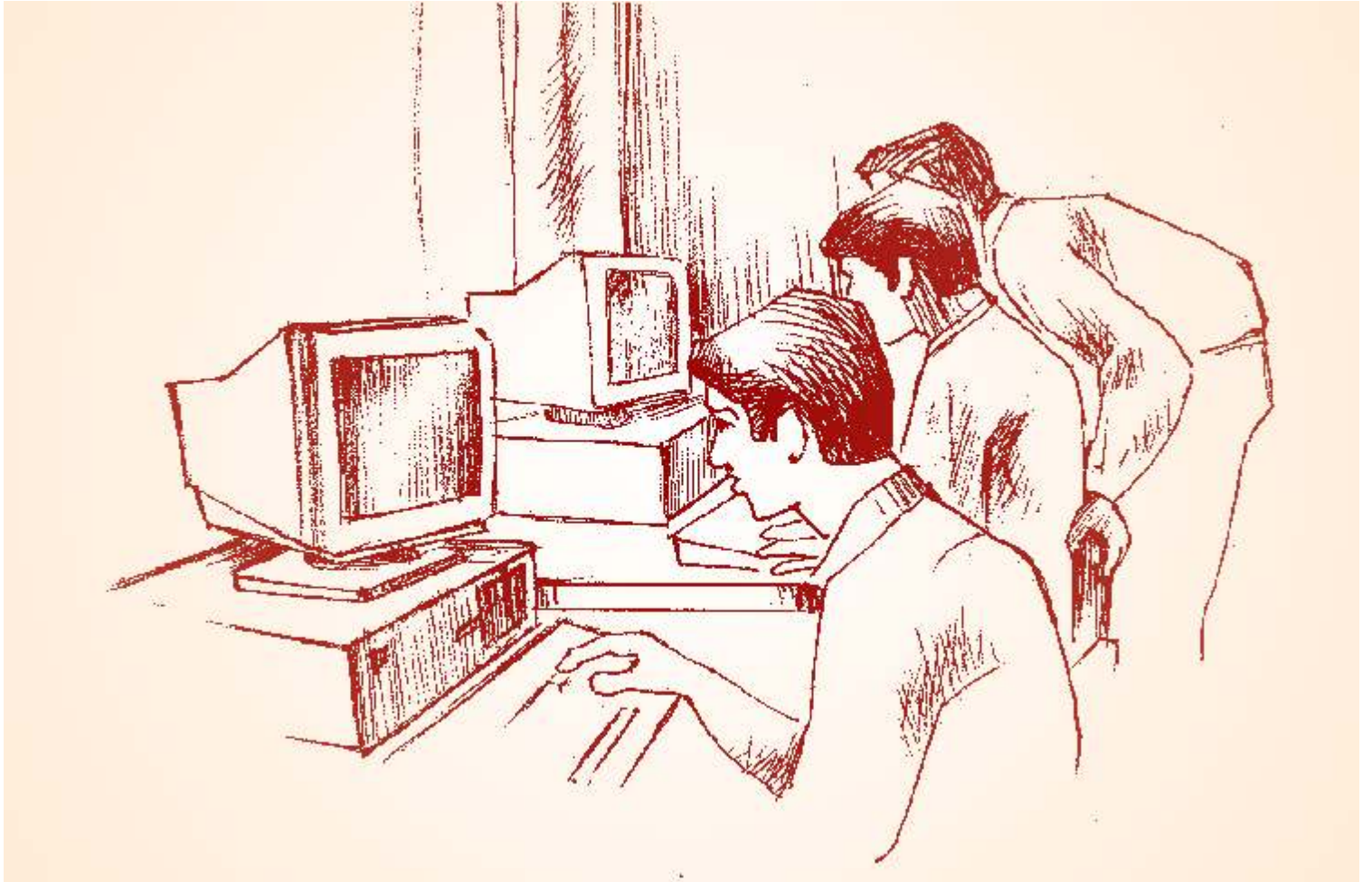


Fig : 14



Fig : 15

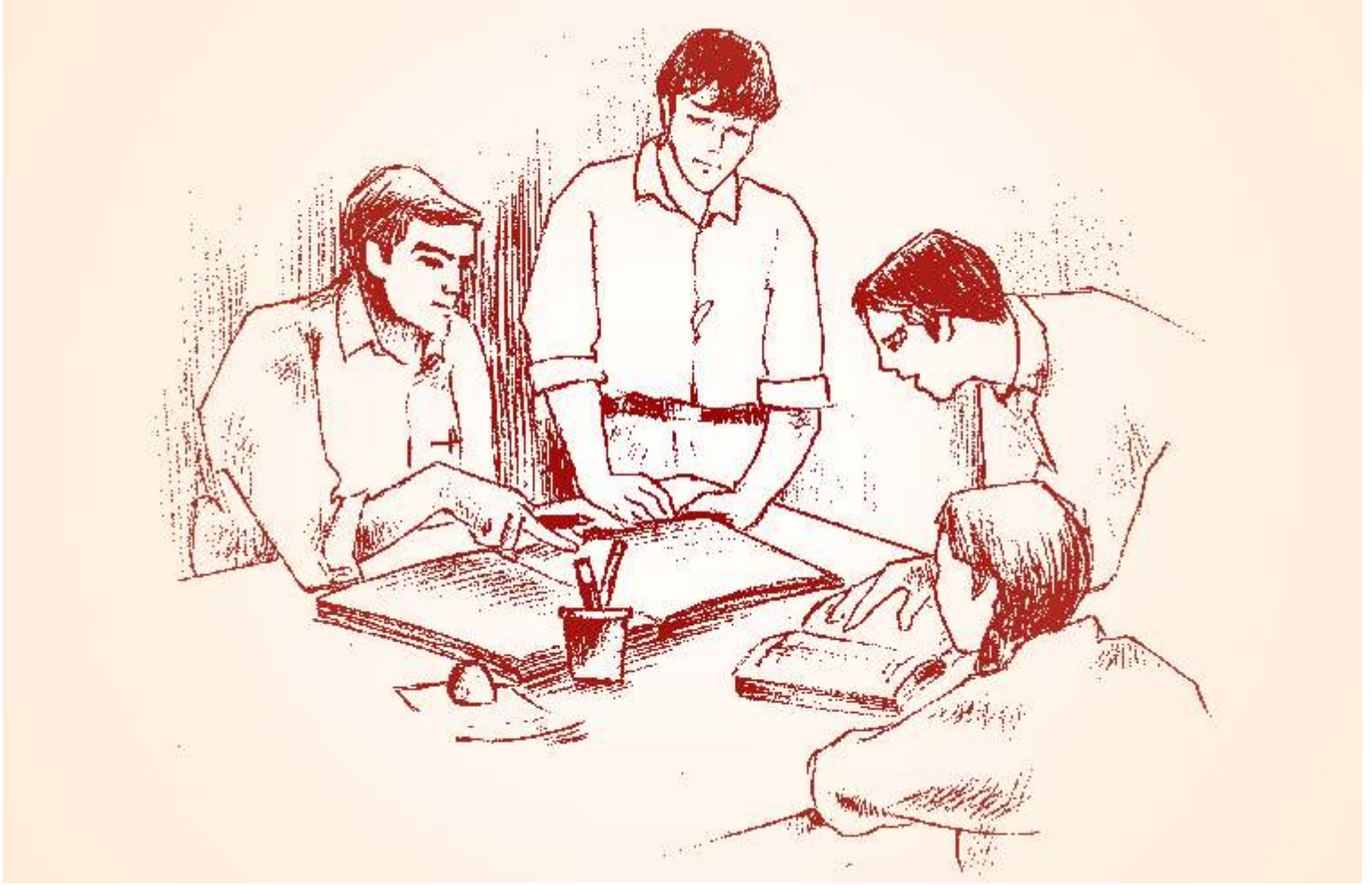


Fig : 16



Fig : 17

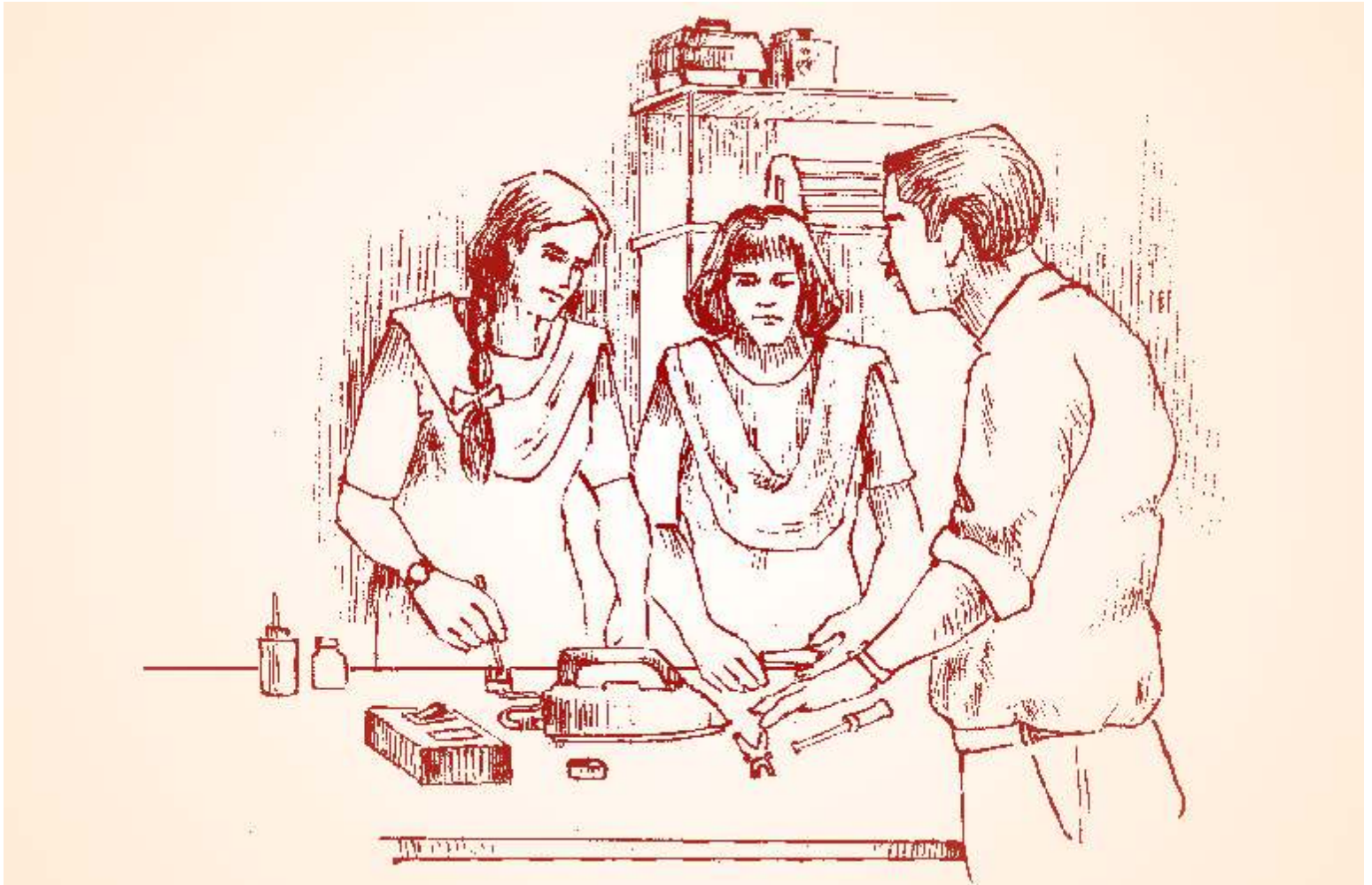


Fig : 18



Fig : 19

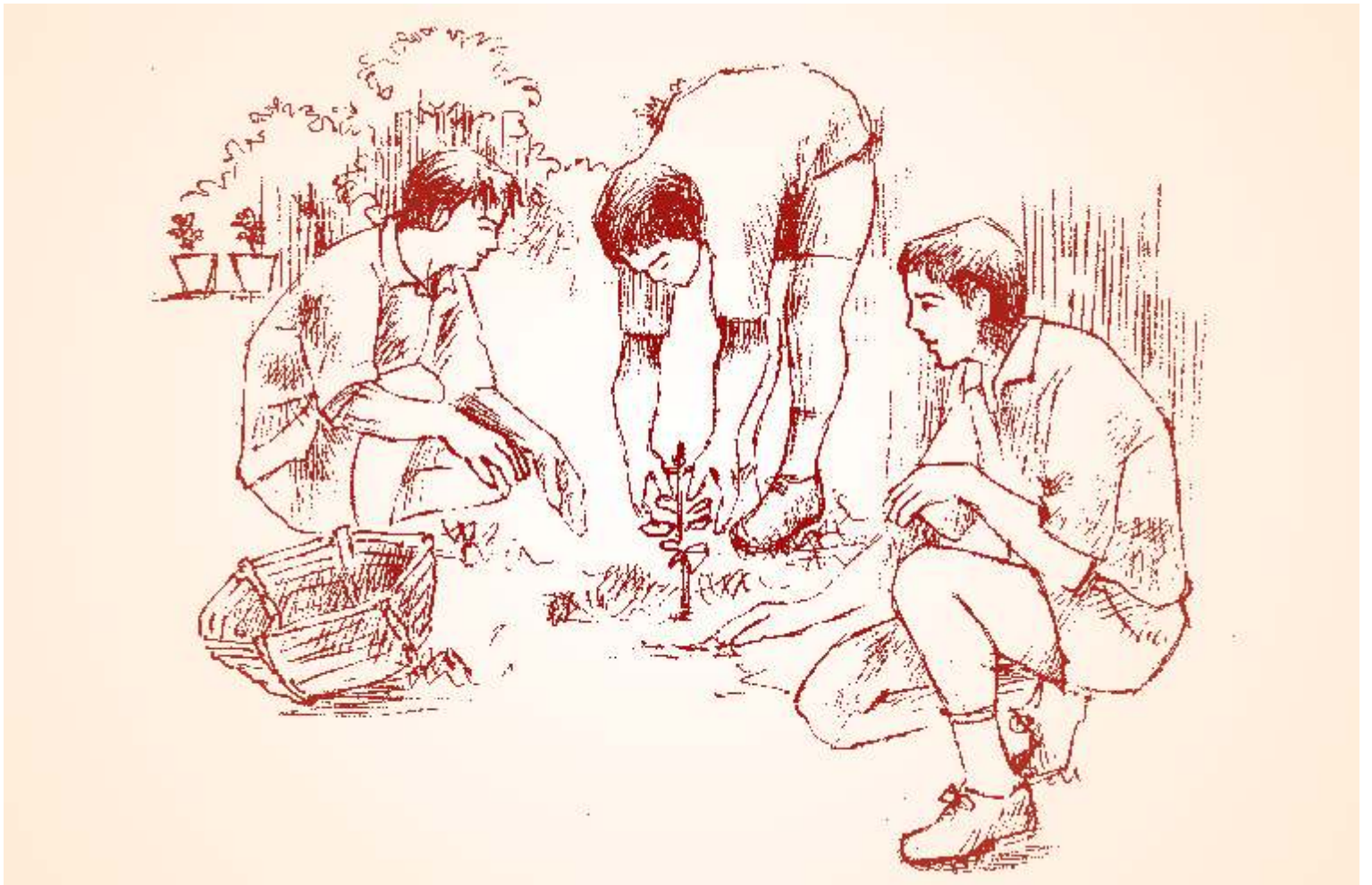


Fig : 20