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Problems Involved in Implementing a Course of Study to a Junior High Crafts Program

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PROBLEMS INVOLVED IN IMPLEMENTING A COURSE OF STUDY TO
A JUNIOR HIGH CRAFTS PROGRAM

A Paper
Submitted in Partial Fulfillment of the Requirements for
The Degree Masters of Science in the Graduate Program of
Eastern Illinois State College.

By

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Approved by ____________________________

Date May 8, 1956
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THE PROBLEMS INVOLVED IN IMPLEMENTING A COURSE OF STUDY TO A JUNIOR HIGH CRAFTS PROGRAM

Industrial arts, compared to the older academic subjects, is a fairly new field of education and in many respects differs materially from them. The older academic subjects has to do with abstract situations while our new field, industrial arts, is closely related to the manipulative phase of training. Because of this difference it is important that its organization, supervision, and administration be given special attention. Industrial arts is also an expanding field in which new problems must be met every day. Because of its nature, the development of industrial arts should be the responsibility of some individual who has a sound educational background, a familiarity with modern industrial practices and development, a philosophy of education broad enough to consider the social status of individuals, and a broad understanding of what value industrial arts courses are to the student.

Because of the popularity of such courses, many elementary and nearly every secondary school in the country is now engaging in some form of industrial arts activity. Schools everywhere are offering some type of manipulative activity which usually is a part of the industrial arts program. But to strengthen and extend this activity in many schools and
communities, the first step is for the administrator and
teacher to think through and implement a plan for the admin-
istration of such activities.

Statement of Problem

Grades seven and eight form a transition area between the elementary school and the senior high school. In the seventh grade the pupil encounters probably for the first time, a different room and a different teacher for most subjects. The individual is permitted to express more freedom than ever before. This change is an important and serious step in the developmental life of the youngster, especially where the seventh and eighth grades are located in a different school and a change in schools is involved. Usually for the first time industrial arts or crafts is offered as a separate subject in a shop and under the direction of a specialized instructor. A tremendous responsibility rests upon the administrator and teachers whose duty it is to see from the first that the student develops good work habits and proper social attitudes in the shop.

Even more important is the need to assist the student in understanding the purpose of his craft work as an integral part of his total educational program. In the elementary school the industrial arts experiences grow directly out of his social studies work, but in the seventh and eighth grades this correlation is not stressed very highly. Thus, craft instructors must maintain a different organization and administration if they expect the student to gain his experiences in the craft shop.
One can find all types of information stating the reasons for maintaining this organization but very few telling us how to implement and maintain it. It is for this reason that many of us have become interested in this aspect of the industrial arts field.

**Definition of Terms**

There has been in the past some confusion concerning the meaning of terms used in the field of industrial arts and industrial education.

This portion of the paper is set aside to differentiate between some of the terms used in this paper so that the reader may become acquainted with the concepts as they appear in the remaining part of the paper.

**Implement**—Implement, as referred to by this paper, has to do with the act of putting certain principles to practice.

**Industrial arts**—"Industrial arts as a school subject is the broad study of the materials, organization, tools, processes, products, and the human problems of industry. It is developed through the planning and construction of projects of interest to pupils, discussions, observation, and readings related to industry."¹

**Industrial Education**—"is a generic term which includes industrial arts and vocational trade and industrial education."²

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Vocational Education—"is a generic term whose scope embraces all kinds of vocationally purposeful education such as industrial, homemaking, agricultural, commercial, etc." 

Junior High School—"Junior high refers to a program of education especially adapted to problems of boys and girls during their early adolescent years." 

Course of Study—"The course of study is a presentation of teaching materials organized and arranged for instructional use. It is the outline of topics to be covered or processes to be performed. In more complete form, it will include additional material for the purpose of assisting the instructor in the presentation of the subject matter." 

Crafts—Crafts has to do with a division of industrial arts in which more freedom and expression is exhibited throughout the work. It is an area in which work is more general than abstract. Crafts as referred to by this paper has to do with a division of industrial arts located at the intermediate level.


The two main factors which will determine the length of time devoted to the crafts periods are: (1) the time scheduled for regular class periods of the school, (2) the pressure of other school activities in the school day.

Junior high schools organized with periods approximately sixty minutes in length often assign pupils to industrial arts classes for one period each day for a total of three hundred minutes per week. Because of the time necessarily required to distribute and collect tools and supplies, a period shorter than sixty minutes per day is not considered economical. The shorter the period, the greater the percentage of time lost in the distribution and collection of tools and materials.

However, in some cases three double periods of ninety minutes per week are accepted and are equivalent to the sixty minute period as far as time is concerned. In schools with less than sixty minute periods this method is recommended.

In many cases the pressure of other school activities will limit the amount of time spent in crafts. Such activities as music, home economics, business education, and art are fields in which the individual should receive training. Therefore, it may be that the time devoted to crafts work will be less than that desired.
Equipment

Since the industrial arts program for grades seven and eight is concerned with general craft activities, constructions are made in lighter forms than in the general area type of shop. Therefore, the heavier type of machinery and equipment is not needed in the crafts program. The task of equipping the craft shop carries with it a great amount of responsibility. Too often equipment has been purchased with little concern for "needs" as expressed in our psychology of education. 6

Reference has been made to the crafts shop as being organized on a general composite basis. It may be similar to the ninth grade general shop but on a more exploratory basis.

The purchasing of equipment for the school shop is a long-term investment because of the fact that the machines and tools bought are expected to last for a long time. The hard usage the equipment receives necessitates the practice of selecting only first quality items and brands for the shop.

Before tools and equipment have been selected for the shop, the instructor or person selecting the equipment might profit by acquainting himself with conditions in other school shops with similar programs. Yet in many cases, the instructor merely sits down and makes out his equipment list without ever consulting any one or any type of printed materials.

New designs of more suitable furniture (shop) and tools for school use are constantly manufactured and offered for sale. This does not intend to say that the latest is the best, but there is reason for believing that new designs have been based upon needs made evident by failure of available tools to function satisfactorily.

It is obvious that a list of equipment cannot be standardized because of the various conditions under which it must be used and the objectives which are to be achieved in the shop. Before the teacher begins making out his list he should become familiar with: (1) the philosophy of the school, (2) shops of similar character, (3) description and specification of equipment, (4) well-known companies supplying equipment, and (5) recommendations of experienced teachers in the field. 7

When the teacher has familiarized himself with most of the available information, he should set out to arrange a complete list. After the list has been made, certain items may be revised or crossed out to meet the available funds.

Following is a list of factors to be considered in making the list:

1. Objectives of course
2. Types of work to be done
3. Course of study
4. Maturity of pupils
5. Size and location of room
6. Design of equipment
7. Quality of equipment

Detailed lists of equipment cannot be given here because of the great variety. However, a copy of the suggested equipment list for a given situation may be found in the appendix.

Last, but certainly not least, we should be reminded that it is very important that we buy the right machine for the job. There is little that is more disheartening to the administrator than expensive equipment which is not frequently and purposefully used.

**Materials**

One of our big problems in the area of administration that has to do with materials in the question, "Is it better to charge students for materials or to have the school furnish them"? Probably there are as many instructors in favor of one method as the other. However, most schools require that the students pay for their materials because of the shortage of funds.

Administrators and instructors who are in favor of this method usually list the following arguments:

1. The student feels more responsibility for his work if he must pay for his materials.

2. Less material will be wasted because of the fact that if the student is required to pay for his materials it is less likely that he will waste it. Therefore, better habits of thrift and conservation are taught.

3. The overall expense to the school will be lessened, cutting down on the high cost of industrial arts education.

4. Whatever the student makes will become his property, therefore, resulting in better workmanship.
5. Students will be less likely to select a project that is too large and difficult to construct.

Of course, there are arguments supporting the other point of view but for the most part, educators agree that for the present it seems to be the best solution. However, it is generally accepted that best results are obtained only when the major items of materials are paid for by the student. Such incidentals as screws, dowels, sandpaper, and finishes are items that can be replaced by a small amount of money compared to the overall expense.

One of the arguments against students being required to pay for their materials is the excess work in the handling of money by the instructor. However, the plan recommended involves no handling of money by the crafts instructor.

It is suggested that the instructor have the student purchase a materials cost card. This card may be purchased in the administration office or any place where money is handled in the school.

Below is a typical sample of a cost card which could be purchased by the student:

```
Name_____________________
10 10 10 10 10 10
   5 5 5 5 5 5
   1 1 1 1 1 1 1 1
```
The cost card is turned over to the shop instructor and is put on file. Whenever the student figures the cost of the project, numbers on the cost card are punched out corresponding to the same amount of cost of the project. (See appendix)

This is not the only way in which cost of materials may be handled. There are many other ways just as efficient. This is only one means of handling the records when students are required to pay for the materials.
THE IMPLEMENTATION OF THE COURSE OF STUDY

Reference Materials

Books have somewhat different significance in the crafts shop than in other classes. Books are seldom used as texts, but as a source of information, their use as reference material is increasing. A number of years ago it was not uncommon for a crafts student to learn from imitation and strictly from lectures and demonstrations by the instructor. Today, although imitation is used to a large extent, the student has access to a large number of books and references which tell him what he wants to know. This is why it is very important that the shop have a good library. A library with good books is an essential part of the equipment in the shop. Not only should books be kept in the library but magazines, catalogues, and typewritten materials that are connected with crafts and industrial arts.

The average crafts teacher should collect from many sources a variety of materials that should become part of the shop library. Such a collection should be the result of continuous searching for good projects, designs, and materials. This material, kept in scrapbook form, should represent one of the teacher's most effective tools of teaching.

It is suggested that along with books a use should be made of charts, pictures, and display materials for reference use.
Another idea might be that of the use of a card index to projects. This information on the cards will include types of projects plus a short statement about the project. Also, this information should tell the reader where he can find the plan or picture of the project and more information concerning the same.

Probably the important thing to remember in planning for an area for reference material is that it is the responsibility of the instructor that he assemble the necessary material so that the student has immediate access to it.

Other items which may be used to help make up the reference materials are manuals, charts, posters, model projects, and films. (See appendix, page 4).

Projects

What do we mean by the term "projects" in industrial arts?

The term may be applied to any purposeful activity in any subject but in industrial arts often we refer to a "project" as an article made in the shop, purposefully selected, planned and executed by the pupil, together with all the general related information which can be reasonably presented. 8

Since the time of the Swedish Sloyd and the Arts and Crafts Movement the project has served as a vehicle for the

development of skills, knowledges, attitudes and work habits in the shop.

To the instructor the project is a means by which he can transfer his knowledge and skills to the pupil. The project must be something of a compelling interest to the student.

Teachers of the crafts have a widely differentiated method of using projects. It is very seldom that any two teachers have the same method in choosing, assigning and checking projects. However, we can say that most of the methods fall into one of the following categories:

**All projects assigned**--Where the instructor is interested in all students covering the same processes and operations he may use this technique. This is common in crafts as well as in other industrial arts work. This has been found to be a desirable method of instruction where classes are large. In this plan a more simplified method of choosing, planning and checking of projects may be used. Too, group instruction can be used to a greater extent.

**Choice within groups**--In this technique the instructor may have a number of projects in a certain group. These projects will contain practically the same operations and processes and be about the same degree of difficulty in construction. This method has the advantage over the assigned method in that the student has a choice of projects.

Although many industrial educators feel that the crafts teacher should dominate selections of projects for students in the craft areas they, nevertheless, maintain that the project should conform to certain criteria. Some of these criteria are:

1. They should include the processes to be taught in the course in small numbers in the first project and a larger number as the student progresses.
2. They should hold interest to the student and challenge him, yet they should be within his limits of construction.

3. They should be suited to the school shop conditions.

4. They should be of such nature that the student can complete them in a reasonable amount of time.

Although there is a third group in which all projects are electives, it is suggested that this group be used in a limited way in the craft classes because of the time available to complete such projects.

However, we, as instructors, must remember that the project is only a means to an end and not an end in itself. In many cases too much emphasis is placed upon the project and the real goal of developing the individual has been forgotten.

A list of projects suitable for craft areas may be found at the end of each unit in the course outline attached.

**Demonstrations**

From the time that instruction in the shop work was introduced into the schools, the demonstration has stood out as the most definite and valuable means of instruction. It is desirable in the shop courses to have the student learn correct procedures and techniques. This can most easily be done by observation and in order for the student to observe someone must demonstrate. A great amount of a student's success in life depends upon his imitation of the educator. This is especially true in the crafts.
The shop demonstration, if performed by a skillful teacher, very seldom fails to result in developing and maintaining interest. This is probably due to factors such as these: (1) There is an appeal to the sense of vision, (2) Skillful performances always attract attention, (3) Students see things take form under the hand of the instructor, and (4) A desire is aroused in the student to repeat the good work.

The demonstration, then, is probably the teacher's greatest tool in reaching his goal in teaching. The success of the student in many cases will depend upon whether the instructor is capable of transferring a technique from himself to the student.

In most craft classes demonstrations are divided into three classes; namely, class demonstrations, small group demonstrations and individual demonstrations.

The class demonstration is usually given most frequently in early stages of the course when the class is working in a rather narrow range of work. The advantages of this type are that the instructor saves time by demonstrating to the whole group and the entire class receives the same instruction.

A group demonstration differs from a class demonstration only in that it is presented to a portion of the class. This is usually due to a certain number of students who are ready for advanced stages and a demonstration to the whole class would prove unsatisfactory or, the processes may vary so that the demonstration may prove not valuable to some in the class.
The individual demonstration is usually given to pupils who are behind in their work and an amount of time has elapsed so that they have forgotten the original demonstration. Also students may be absent at the time of the demonstration and in this case individual demonstrations may be necessary.

In the junior high crafts it is recommended that the demonstration should not exceed fifteen minutes at one specific time. It is up to the instructor to decide the length of time for each case. It is considered to be unsatisfactory practice when an instructor devotes a whole period to a demonstration in the crafts class for junior high.

In selecting the processes to be demonstrated one needs to consult the list of learning processes in his course outline or syllabus. (See appendix)

Visual Aids

Visual aids to instructors are not merely to read and know about. They are devices and techniques to be used. Visual aids cannot replace the teacher in the classroom but they can make the job much easier for the instructor when he is there. Reference is made to visual aids by many people when they are referring only to films. However, films are only a part of the visual aids area. Such devices as trips, demonstrations, pictures, charts, bulletin boards, blackboards, films, strip films, and slides make up the majority of the visual aids field.
Motion pictures have a definite place in the crafts area, provided that the instructor appreciates and knows their proper use and will prepare himself and his class towards their maximum contribution to the situation. The idea of showing pictures for mere entertainment in the school shop should be ruled out.

Visual aids of some type are almost never entirely left out when teaching skills and manipulative activities. It is practically impossible to learn how to perform a series of processes without reference to such visual aids as the demonstration, pictures, charts, and diagrams.

One of the areas of visual aids that lacks attention in many of our shops is the bulletin board. In many cases the bulletin board is merely a place where rules and regulations are placed and are kept there permanently without change. With very little extra time each week spent by the students and instructor, the bulletin board may become an attractive and useful visual aids. Coloring adds to the bulletin board in that it helps attract the eye. Pictures, charts, safety posters, and other things can be displayed very effectively on the bulletin board.

The statement that visual aids are overworked in our shops is usually made by people who are referring to films only. Taking all the visual aids into consideration it is probably more so that they are under emphasized than over emphasized. The lack of results secured in some cases from the use of the visual aids can be traced to a lack of planning for the proper use of these helps.
A film list is helpful in selecting the right film for the specific learning situation. Such a list is included in the appendix, page 37.

Testing

Determining and recording grades in a shop are procedures handled differently by different teachers. However, administrators usually require that a grade be turned in at the close of the course. Some teachers may forget about a grade until this notice comes out, and again some teachers may keep a very accurate account of everything the student does. Both systems are considered inefficient. In order to be fair to the student some type of systematic way of grading must be maintained. In this manner the student will know what is expected of him and will work toward that goal. If he doesn't know what the instructor expects of him he is very likely to be disappointed when grades are given out.

Tests are an efficient way of measuring the student's knowledge of the crafts work. However, the instructor should not rely entirely upon the outcomes of the tests in determining the student's grade. Such things as projects, assignments, and social development should be taken into consideration in evaluating the craft student. (See appendix page 9)

There are many types of tests available for use in the crafts shop. One of the most commonly used is the objective type. Classified as the objective types we may have the following:

**Multiple choice**—This is a test where the student is given several possible answers and he is to select the right one or the one nearest correct.
Identification--In the identification test, the student is to identify an object, work or phrase with its description.

Completion--The completion test is so designed that the student must supply a word or words to complete the statement and make it true.

True-false--This test consists of a series of statements which may or may not be true. The student is required to mark the statement true or false.

Another type of test which is sometimes used by instructors is the subjective test. In this type of test the student is asked to write concerning the question. This type of test may also be used as an oral exam.

When organizing a test for craft activities the instructor should keep in mind the following items:

1. Tests should cover important items
2. Questions should be brief
3. Only one answer should be possible
4. Tests should cover many items
5. Obvious material should be omitted
6. Tests should be within the capabilities of the students.

Efficient testing of work is a distinct factor in efficient teaching. To be sure, it is a common saying that students should not work for credits and grades but still we must have a systematic way of evaluating his work.

Personnel Organization

Because of the numerous demands on the teacher's time in the crafts shop it seems advisable to set up some sort

of organization in which members of the class take over some of the duties of the instructor during the class period. These responsibilities delegated to students will help develop desirable character traits as well as to provide an opportunity for the student to develop socially. However, this process may be over used and the outcomes may be far worse than if the teacher had no personnel organization at all. To be successful in such a plan the instructor must understand the fundamentals of such a process. He must accept the idea that first of all the plan must be organized in such a manner that the student will benefit from it and the idea that the work of the instructor will be lessened must be listed as a secondary item.

To be successful the organization must be developed with the cooperation of the students, so that they fully understand the plan. They should feel that the duties are not an extra assignment but an integral part of the course. If possible all members of the class should take part in this plan in some manner.

Best results are usually obtained if the students are allowed to elect their fellow students. However, they should be advised that only the students they consider capable should hold that office. Being selected to office by their fellow students tends to make students feel more conscious of their responsibilities in performing their duties.
A list of offices to be held and the duties pertaining to such should be on display someplace in the shop at all times. (See appendix, page 7)

The term of office should last for the length of the course provided the course does not exceed much more than nine to twelve weeks in length. This amount of time provides ample length for the officer to receive the valuable training he should obtain. It should be made clear that once a student holds an office he is not eligible for that office again, at least during the school year.

For the personnel organization to be a success, the teacher must give his full support to the officers in charge in order that they may do their work efficiently.

Good shop management in a crafts shop requires student participation in the control and organization of such a shop. Its success depends upon careful planning and guidance by a well-trained instructor. Student participation in shop management provides practical experience in democratic procedures. A student who assumes responsibilities for certain duties contributes to the welfare of a whole group and to his individual development.

**Safety**

The beginning of safety education for life in an industrial civilization must be found in the public schools while the individual is still in the acceptive age. This is especially true in the crafts areas. We, as industrial arts
instructors, have been looked upon as ones who should develop this safety because we are in the situation where we can teach safety best.

The prevention of accidents is accomplished largely through the reduction of physical hazards and the development of safe work habits. Both are important in the teaching of safety.

Roughly, ten per cent of our shop accidents are caused by physical deficiencies. Listed below are some of the physical factors which cause these accidents:

**Floor space**--Space per pupil varies with the type activity. Too much space may create a discipline problem while on the other hand too little space results in crowding and produces discipline problems resulting from congestion. Experts have set a minimum of fifty square feet per student as satisfactory in most shop work.

**Flooring**--There are several types of flooring that are used successfully. A satisfactory foundation for most floors is a 12 in. layer of gravel and then concrete. Adequate drainage should be provided under the floors. Asphalt tile when properly installed will provide a smooth and long-lasting surface. For some time wood block was the most popular type flooring. Wood is easy to walk upon and is advantageous in that when cutting tools are dropped the blades are not dulled. The disadvantage of wood floorings is that it creates a safety hazard by getting slick, especially when wood shavings are lying on the floor.

**Machine arrangement**--Preferably shop machines should be located along walls whenever possible; this causes the least interference with operators.

It is also recommended that they be located along walls with windows so that more light may be obtained. The one exception of this is the circular saw, jointer, and planer. They should be more centrally located so that long pieces of stock may be worked. To reduce traffic around machines it is wise to keep all tool cabinets away from machines. Safety zones should be painted around the machines in order to help call the students attention to the restricted area.

**Lighting**—Research has proven that good lighting has cut down on a number of accidents in our school shops. Adequate lighting involves general and local lighting. General lighting usually is insufficient to illuminate critical work areas and, therefore, should be supplemented by local lighting.

**Painting**—The school shop can benefit very highly from the use of color. Proper use of colors is conducive of better vision, health, and personalities. Colors definitely have an effect upon a person by psychological aspects. The reds and violets are warm colors and people react in such a manner. The greens on the other hand are a cool color and are typical of rest and quietness. Reds may be used in the shops to indicate danger areas such as the safety zones and used on first aid materials. The greens should be used on machines and walls.

Techniques and devices should be developed for teaching safety as much as they are for teaching other skills. A safety poster displayed on the bulletin board may save an eye or hand.

**Conclusion**

More and more every day our universe is becoming industrial minded. This being so, it is important that people be able to adjust to this situation adequately. We, as teachers and directors of industrial education, must play an important part in preparing students for such a situation.
So, what better place could we start this adjustment than in the seventh and eighth grades when the individual is in the receptive age. Because of this being true, the field of industrial arts is growing by leaps and bounds all over the country. Thus, in crafts, as in other areas of industrial arts, we have a problem of maintaining and organizing materials and courses of study to meet the needs of the individuals.

The administrative phases of implementing these materials and courses of study should receive much attention and thought before the actual application is made. Such things as time devoted to classes, equipment and materials are items that call for a large amount of research and study before the instructor can expect to gain the greatest amount of results.

The implementation of the course of study, too, should receive much attention before actual implementations are made. For example, if we were to implement a course of study without knowing what type reference materials we were going to use the outcomes would more than likely be evident. Reference materials then, along with projects, demonstrations, visual aids, testing program, personnel organization, safety and others, are items which we must plan in advance if we expect the student to be able to adjust to the industrial society smoothly and without an abrupt change which he may long be affected by.
BIBLIOGRAPHY


APPENDIX I
INTRODUCTION

This course of study has been prepared for students of the seventh and eighth grade level in the junior high schools. All instruction included on the following pages refers to boys and girls of this level.

Each student of the seventh and eighth grade has an opportunity to receive instruction in several types of crafts. The seventh grade student is offered woodcraft, sketching, leathercraft, and electricity.

Provisions are made to obtain best results in learning by having each class meet for fifty minutes per day, five days a week.

The major part of the students time is spent in the shop. Eighth grade students spend about one-sixth of their time in supervised study sessions. Seventh grade students have no supervised study periods as such. Class discussions, lectures, and demonstrations are the major means of gaining related information. Related information is not stressed in the seventh grade. The teacher responsibilities as far as organization of classes are listed in the schedules on the following page.
**SEVENTH GRADE**

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**EIGHTH GRADE**

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STATEMENT OF EDUCATIONAL PHILOSOPHY OF INSTRUCTOR

My philosophy of education is based upon the premise that the welfare of the individual and the welfare of society are coequal as the dominant aim of education in a democracy.

Learning is an everyday process in living. It is the result of all the daily experiences in which a child participates in his home, school and community. It is the task of the school to help provide the experiences most worthwhile for the highest development and learning of all the people of the community. And it is the task of the instructor to interpret these experiences so that the students may benefit from them.

Education being life itself implies that the means necessary to accomplish our aims is continuously with us. Classroom experiences must be based on the pupils' personal and social problems. Children need the opportunity to imitate, experiment and explore. Democratic procedures must be practiced in the school and classroom. Practice in correct habit formation is necessary so that courtesy, promptness, accuracy in work, honesty, industry and personal cleanliness become part of the daily life process.
PLAN OF INSTRUCTIONAL PRACTICES

Introduction

Many methods of teaching may be used to teach the following courses. There are many factors to consider in selecting the instructional practices one wishes to use. With my teaching situation in mind, I plan to use the following methods for gaining the most effective type of instruction.

Teaching Methods

To achieve the desired objectives of this course the following teaching methods will be practiced:

a. Demonstrations
b. Class and group discussions
c. Individual instruction
d. Lecture (limited basis)
e. Assignment sheets--(eighth grade)
f. Limited choice projects

Instructional Aids

Effort will be made to use as many teaching aids as possible. Many shops have some possibilities that are never explored. When possible the following aids will be used:

1. Textbooks
2. Library
3. Student manuals
4. Charts, posters
5. Model projects
6. Motion pictures
7. Blackboard--bulletin board
8. Strip films
9. Progress charts
10. Analysis chart--(teachers use)
Providing For Individual Differences

To provide for the individual differences each student will be permitted to progress at his own learning rate. A manual will be provided containing the projects, assignments, and a limited number of information sheets. Certain projects will be required and some will be of student choice. The unusually capable students will be encouraged to work into the more-advanced projects. The less fortunate, slow learners may advance at his own learning rate. Special individual help from the instructor will be available for the slow learner.

Student Personnel Organization

A good student personnel program will lift certain minor responsibilities from the instructor giving him more time for individual help. Responsibility delegated to students will help develop desirable character traits as well as to provide an opportunity for the student to develop socially.

The organization will consist of the following: shop foreman, tool foreman, supply foreman, record clerk, safety foreman, librarian, and sweepers.

These officers are elected by their classmates, (plus teacher guidance). Each student, regardless of his position, will be required to clean his own work station and to replace all tools used by him. At the beginning of each nine weeks period new officers will be elected. Students holding office before are not eligible to hold the same office.
twice in succession. A list of the supervisory jobs, duties of each, and the students responsible will be placed on the bulletin board. The duties of the various jobs will be as follows:
JUNIOR HIGH INDUSTRIAL ARTS

Shop Personnel Plan

School ___________________________ Grade ______ Section ______
Cleanup time ______ Dismissal ______

I. Shop Foreman
   a. Sees that all assigned duties are carried out
   b. Rings bell at cleanup time
   c. Supervises class in absence of teacher

II. Tool Foreman:
   a. Checks all tool cabinets at end of period
   b. Reports to shop foreman after final check of tools.

III. Supply Foreman:
   a. Checks bill of materials and issues supplies from supply drawer.

IV. Record Clerk:
   a. Takes roll and fills out attendance sheet
   b. Checks plan sheets for correct cost of materials

V. Safety Foreman:
   a. Supervises cleaning up of the finishing area
   b. Reports need of first aid treatment
   c. Administers treatment in case of minor accident
   d. Reports any unsafe practices
   e. Stores dangerous materials properly

VI. Librarian:
   a. Hands out and collects manuals
   b. Responsible for neatness of library

VII. Floor Sweepers

   Wk. ___________________________ Wk. _________________________

   ___________________________ _____________________________
   ___________________________ _____________________________
   ___________________________ _____________________________

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Student Planning

Students are provided with a planning sheet that is to be filled out before any project can be started. Students, with the aid of the manuals, are taught how to plan their projects, make a bill of material, and make a simple sketch of the project to be constructed. For beginning students a plan of procedure is copied from the manual directly to the planning sheet. Later projects are planned by the instructor and students together and still later the student may make the plan of procedure without any help.

The planning sheet has two locations in which the record clerk, and the supply foreman sign their initials. The record clerk merely checks the sheet to see if the student has checked the cost of the project off the shop ticket and signs. The supply foreman issues stock and signs the planning sheet provided the sheet is complete. The student then obtains the materials and begins work. He is required to turn the planning sheet in with the finished project. A grade is recorded on the planning sheet in the provided places marked O, A, and C. "O" is meant for organization of planning sheet. "A" means the appearance of the project, and "C" is for the completeness of the project. All are based on a series of ten points each. A grade is recorded on the planning sheet and returned to the student along with the project. (See appendix)
Evaluation

Regulations authorized by school boards usually require that each student be given a "class" grade at the end of each nine week period. This grade represents 75 per cent of the students grade as considered for this course of study.

An objective test will be given at the close of each nine weeks period to evaluate the progress of students. Either at the close of the nine weeks period or about midway in the course it is planned to administer an "object" test to the class. All tests are to be teacher constructed. The tests (sample) may be found at the end of this course of study.

Four major factors will be taken into consideration in determining the grade. A letter grade will be assigned each student for each nine weeks work completed. The factors and values assigned each follow:

<table>
<thead>
<tr>
<th>Class Grade -- 75%</th>
<th>Method of Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Projects ....... 50%</td>
<td>Observation</td>
</tr>
<tr>
<td>a. Appearance</td>
<td>Checking</td>
</tr>
<tr>
<td>b. Completeness</td>
<td></td>
</tr>
<tr>
<td>c. Time</td>
<td></td>
</tr>
<tr>
<td>2. Study Assignments.... 25%</td>
<td>Written Assignments</td>
</tr>
<tr>
<td>a. Related information</td>
<td></td>
</tr>
<tr>
<td>b. Neatness of notebook</td>
<td></td>
</tr>
<tr>
<td>3. Social Development ... 25%</td>
<td>Observation</td>
</tr>
<tr>
<td>a. Responsibility</td>
<td></td>
</tr>
<tr>
<td>b. Cooperation</td>
<td></td>
</tr>
<tr>
<td>c. General behavior</td>
<td></td>
</tr>
<tr>
<td>d. Habits, traits, &amp; attitudes</td>
<td></td>
</tr>
</tbody>
</table>

Final Grade

| 1. Class Grade ................. 75% |
| 2. Final Test .................... 25% |
GENERAL OBJECTIVES
(Grade 7 & 8)

OBJECTIVE I. To develop in each student elementary skill in the use of simple hand tools and machines and a knowledge of basic procedures for successfully completing a variety of shop problems.

Activities to Accomplish Objectives:

1. Give class demonstrations and individual help for slow learners.
2. Motivate students before demonstrations.
3. Demonstrate proper use of machines.
4. Have students work to standards reasonable for their grade level.

OBJECTIVE II. To develop in each student desirable habits, traits, and attitudes such as honesty, fair play, initiative, etc.

Activities to Accomplish Objectives:

1. Use a personnel system for student responsibilities.
2. Assign each boy some duty or activity.
3. Discuss responsibilities of each boy regardless of other assigned duties.
4. Insist that each student fully perform his shop duties.
5. Keep shop clean and orderly.
6. Encourage pupils to think for themselves.
7. Point out that freedom in shop depends upon individual behavior.

OBJECTIVE III. To provide opportunity for student to explore his abilities in several areas of work and to provide for
enough experiences in many areas to wisely choose an area
of work to pursue when he enters high school.

Activities to Accomplish Objectives:

1. Have good reference material available.
2. Have a good variety of materials.
3. Encourage outside hobbies and activities.
4. Offer a good variety of areas of work.

OBJECTIVE IV. To develop in each student a willingness to
participate in cooperative ventures, and an ability to get
along with others.

Activities to Accomplish Objectives:

1. Assign an advanced student to help
another who is behind in his work.
2. Ask for volunteers to introduce a new
student to the shop and to help him get
started with his work.
3. Have a student work with someone on the
same job, such as sweeping, etc.
4. Point out the need for taking turns and
encourage this scheme when short on tools.

OBJECTIVE V. To develop in each student good habits and
attitudes with respect to health and safety.

Activities to Accomplish Objectives:

1. Provide for safety instruction.
2. Insist that no "horseplay" be allowed.
3. Discuss dangers of contagious diseases.
4. Keep tools in good condition.

OBJECTIVE VI. To develop in each student an interest and
Appreciation of industrial arts and to develop an interest
in leisure time activities.

Activities to Accomplish Objectives:

1. Provide an opportunity for students to gain experience in many areas.

2. Discuss values of hobby workshops at home.

3. Encourage spare-time work at home.

4. Take field trips to local industries.
CRITERIA FOR SELECTING PROJECTS

When selecting projects for any instructional program, the following points should be kept in mind:

1. **The project must incorporate operations to be taught.** Since the basic operations are primarily the main core of the teachable content, the projects selected should embody these necessary operations. Accordingly, each project must be carefully analyzed so there is assurance that the desired ends are attainable.

2. **The project must be of interest to the student.** Too often projects are chosen by the teacher either because they seem appropriate for the course or because their construction is easily controlled for a given situation. As a result, the completion of such a project generally becomes a necessary chore, something to be done in order to satisfy the requirements of the course.

3. **The project must possess utility value.** Next to having student appeal, a project should be practical, that is, have some useful purpose. The student should be able to use the finished project as a personal possession or take it home as a useful household article.

4. **Each project should introduce new instructional material.** The function of any course is to provide a variety of experiences. Unless each project contributes some new learning process, the time spent on it may be questionable.

5. **The project must be within the student's ability to make.** It is very disheartening for any person to work on a job that inevitably leads to failure. The work must offer a challenge if interest is to be maintained.

6. **A project must be well designed.** The instructor must require that good principles of design are used in making projects. Actually the shop teacher should be as concerned with teaching basic principles of good design as the art teacher.
7. **The project must be reasonable in cost.** This is especially true if students have to pay for the material used. The expense in building projects requiring costly or a great deal of material is generally disheartening to most students.
SEVENTH GRADE WOODCRAFT

Woodworking is one of the most interesting of all the craft activities. Children of the seventh and eighth grades should have an opportunity to work with wood and to learn to use the various tools and simple machines. They should understand the importance of quality and good design in the products of the woodworking industry. They need this experience as a part of their general education and as a means of determining their interest and abilities.

SPECIFIC OBJECTIVES

1. To develop in each pupil methods of handling tools so that good technique may be acquired.

2. To develop in each pupil an understanding of the characteristics of certain woods and the various ways whereby wood can be formed into objects of utility and beauty.

3. To develop in the pupil an appreciation of good work habits.

4. To develop in the pupil an appreciation of safety and how it is applied in the woodworking shop.

5. To develop in each pupil the interest and enjoyment in woodworking for leisure-time activities.

LEARNING UNITS: How to—

1. Fill out a planning sheet
2. Read a simple drawing
3. Transfer designs to wood using carbon paper
4. Identify:
   a. Basswood
   b. Willow
   c. Pine
   d. Walnut
5. Read a rule
6. Make a bill of material
7. Make a simple sketch
8. Use a template
9. Saw inside and outside curves using a coping saw
10. How to select the right type of blade for sawing with the coping saw
11. Smooth edges using file
12. Identify types of files
13. Carve using a sloyd knife
14. Drill holes in wood using a hand drill
15. Color composition board using crayola and turpentine
16. Fasten with wire nails and brads
17. Identify types of nails and brads
18. Burn straight and curved lines using wood-burning tool
19. Shade areas using wood-burning tool
20. Change tips in a wood-burning tool
21. Layout curves using rule, dividers and pencil
22. Cut thin stock using jig saw
23. Bore holes using auger bit and brace
24. Cut dowels using back saw
25. Assemble project using glue
26. Clean a file using a file cleaner
27. Install a coping saw blade
28. Apply oil stain
29. Apply shellac
30. Apply wood seal
31. Clean and care for shellac brushes
32. Apply paste wax
33. Apply tempera colors with a brush
34. Smooth wood surfaces with sandpaper.

**SUGGESTED APPROACHES**

1. Lectures
2. Displays
3. Demonstrations
4. Visual Aids
5. Projects

**SUGGESTED PROJECTS**

The projects on which the students of the seventh and eighth grades work will naturally depend upon their interests and abilities. Some of the boys and girls may be well-advanced in their abilities and skills in doing woodworking, and others will need to spend considerable time in understanding the use and care of tools and in work on simple projects.
Following are some suggested projects:

Cutting board  
Book ends  
Wall shelf  
Magazine holder  
Serving tray  

Name plates  
Letter openers  
Carved figures  
Footstool  
Hamburger press

BIBLIOGRAPHY

1. Fryklund & Secrest -- *Materials of Construction*
2. Fryklund & LaBerge -- *General Shop Woodworking*
3. Groneman -- *Exploring the Industries*
4. Douglass & Roberts -- *Units for Hand Woodworking*
5. Sowers -- *Woodcarving Made Easy*
SEVENTH GRADE METAL CRAFT

The practical application and experience involved in a program of metal arts, as well as the development of original thinking, is essential to any educational program. The importance of metals becomes evident when specific uses of metal in industry, home, and travel are portrayed.

SPECIFIC OBJECTIVES

1. To develop in the pupil an understanding of metal crafts and how they are used in our everyday life.

2. To develop in each pupil a knowledge of tool techniques and use and care of some common metal-working tools.

3. To develop in the pupil an appreciation of own tools, equipment and good design and workmanship.

4. To develop an understanding of the safety principles involved in metal craft activities.

5. To develop in the individual good work habits with his fellow students.

LEARNING UNITS: How to--

1. Fill out a planning sheet
2. Read a simple drawing
3. Read a common rule
4. Layoff measurements with a rule
5. Draw arcs and circles using dividers
6. Use a template
7. Scribe lines on metal with an awl
8. Punch large holes (\(\frac{1}{4}\) in.) with a solid end punch
9. Fold a hem with a bar folder
10. Polish metal with steel wool or emery cloth
11. Saw metal with jewelers saw
12. Saw metal with a jig saw
13. Saw metal with a back saw
14. Smooth metal on forming stake or anvil
15. Drill a hole with hand drill
16. Drill a hole using drill press
17. Rivet sheet metal
18. Smooth and design metal using a file
19. Engrave initials or design in metals using vibrator tool.
20. Peen metal using peening hammer
21. Buff metal using buffing compound and buffer
22. Form metal by hand
23. Form metal with wood forms
24. Solder with a soldering copper
25. Tin a soldering copper
26. Identify types of solder
27. Tool sheet metals
28. Chase a design in metals
29. Raise and recess metal on wood by tapping
30. Apply spray lacquer finish to metal
31. Apply lacquer by dipping
32. Apply non-oxidizing finish using brush
33. Apply enamel using brush
34. Cut metal using tin snips

SUGGESTED APPROACHES

1. Sketches 4. Displays
2. Lectures 5. Discussions
3. Demonstrations 6. Projects

SUGGESTED PROJECTS

Trays
Name plates
Bracelets
Calendar holder

Biscuit cutter
Metal plaques
House number bracket
Letter holder

BIBLIOGRAPHY

1. Johnson -- The Metal Crafts
2. Lukowitz -- New Tin Can Projects
3. Smith -- Units in Sheet Metal Work
4. Groneman -- Exploring the Industries
5. Berg -- Essentials of Metalworking

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SEVENTH GRADE PLASTICS

Plastics play an increasingly important role in modern living. Thus, the general purposes of this unit will be to familiarize students with the capabilities of working with plastics.

SPECIFIC OBJECTIVES

1. To develop in the pupil the idea that plastics play an increasingly important role in modern living.

2. To develop an understanding in each pupil as to the cost, sources, characteristics, kinds and limitations of plastics.

3. To develop in each pupil an appreciation of good workmanship in plastics.

4. To develop in each pupil good tool techniques and the appreciation of the proper tools to work plastics.

5. To develop in the individual a knowledge and appreciation of safety habits in the plastics activities.

LEARNING UNITS: How to--

1. Fill out a plan of procedure
2. Read a working drawing
3. Care for plastic products
4. Apply dyes to plastics
5. Apply lacquers and paints to plastics
6. Layout design or pattern on plastics
7. Saw plastic with:
   a. Back saw
   b. Hack saw
   c. Coping saw
   d. Jig saw
8. Shape plastics with a file
9. Smooth edges of plastics with sandpaper
10. Polish plastics by hand
11. Polish plastics with compound and buffer
12. Engrave plastics with a file
    b. Knife
    c. Awl
13. Drill plastics using electric drill
14. Prepare a plastic surface for cementing
15. Cement a plastic article
16. Join plastic with various screws
17. Make plastics plyable and workable with heat
18. Form plastics with jigs
19. Smooth plastic with a block plane
20. Carve plastic with a rotary tool
21. Decorate plastic with overlay and inlay

**SUGGESTED PROJECTS**

<table>
<thead>
<tr>
<th>Letter openers</th>
<th>Trays</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracelets</td>
<td>Book markers</td>
</tr>
<tr>
<td>Rings</td>
<td>Cake servers</td>
</tr>
<tr>
<td>Name plates</td>
<td>Paper weights</td>
</tr>
<tr>
<td>Letter holders</td>
<td></td>
</tr>
</tbody>
</table>

**BIBLIOGRAPHY**

1. Knoeder Company
2. Bakelite Corporation
3. DuPont DeNemours and Company
4. Elementary Industrial Arts, Portland, Oregon
SEVENTH GRADE KEENE CEMENT

Keene cement in industrial arts is a craft that is just beginning to show up more and more in our school shops. The following list of learning units is limited to the more simple processes and techniques. As is true with other lists of units in this course of study, the elements should be taught as the pupil applies them in projects of his choosing.

SPECIFIC OBJECTIVES

1. To develop an appreciation of good designs and workmanship in keene cement crafts.

2. To develop in the individual a knowledge of good tool techniques in working keene cement.

3. To develop in the individual a knowledge and understanding of the characteristics of keene cement.

4. To provide for exploratory experiences in the field of keene cement.

LEARNING UNITS: How to--

1. Fill out a plan of procedure
2. Read a working drawing
3. Mix and pour casting of keene cement
4. Remove air bubbles from a casting
5. Apply colors in keene cement
6. Smooth keene cement with a block plane
7. Smooth keene cement with sandpaper
8. Make keene cement forms waterproof
9. Make faceplate ready for poured casting
10. Pour casting for turning on lathe
11. Adjust speed for turning keene cement
12. Hold lathe tools for turning keene cement
13. How to apply wood seal to keene cement with cloth
14. Apply tempra colors to keene cement using brush
15. Apply brown oil pigment finish to keene cement
16. Apply safety rules while turning keene cement

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17. Clean forms after casting keene cement
18. Care for tools after working with keene cement

**SUGGESTED PROJECTS**

<table>
<thead>
<tr>
<th>Plaques</th>
<th>Bowls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trays</td>
<td>Lamps</td>
</tr>
<tr>
<td>Tea tiles</td>
<td>Vases</td>
</tr>
</tbody>
</table>
EIGHTH GRADE WOODCRAFT

Woodworking is one of the most interesting of all the craft activities. Children of the seventh and eighth grades should have an opportunity to work with wood and to learn to use the various tools and simple machines. They should understand the importance of quality and good design in the products of the woodworking industry.

SPECIFIC OBJECTIVES

1. To develop in each pupil methods of handling tools so that good techniques may be acquired.

2. To develop in each pupil an understanding of the characteristics of certain woods and the various ways whereby wood can be formed into objects of utility and beauty.

3. To develop in the pupil an appreciation of good work habits.

4. To develop in the pupil an appreciation of safety and how it is applied in the woodworking shop.

5. To develop in each pupil the interest and enjoyment in woodworking for leisure-time activities.

LEARNING UNITS: How to--

1. Fill out a planning sheet
2. Read a simple drawing
3. Transfer designs to wood using carbon paper
4. Identify:
   a. Basswood
   b. Willow
   c. Pine
   d. Walnut
5. Read a rule
6. Make a bill of material
7. Make a simple sketch
8. Use a template
9. Saw inside and outside curves using a coping saw
10. How to select the right type of blade for sawing with the coping saw.
11. Smooth edges using file
12. Identify types of files
13. Carve using a sloyd knife
14. Drill holes in wood using a hand drill
15. Color composition board using crayons and turpentine
16. Fasten with wire nails and brads
17. Identify types of nails and brads
18. Burn straight and curved lines using wood-burning tool
19. Shade areas using wood-burning tool
20. Change tips in a wood-burning tool
21. Layout curves using rule, dividers and pencil
22. Cut thin stock using jig saw
23. Bore holes using auger bit and brace
24. Cut dowels using back saw
25. Assemble project using glue
26. Clean a file using a file cleaner
27. Install a coping saw blade
28. Apply oil stain
29. Apply shellac
30. Apply wood seal
31. Clean and care for shellac brushes
32. Apply paste wax
33. Apply tempera colors with a brush
34. Smooth wood surfaces with sandpaper

THINGS THE STUDENT SHOULD KNOW

1. The different kinds of commonly used lumber
2. The standard methods of measuring lumber
3. Kinds of glue and the uses made of each
4. Kinds and grades of sandpaper

SUGGESTED APPROACHES

1. Lectures
2. Displays
3. Demonstrations
4. Projects
5. Visual Aids
6. Notebooks

SUGGESTED PROJECTS

The projects on which the students of the eighth grade work will naturally depend upon their interests and abilities. Some of the boys and girls may be well-advanced in their
abilities and skills in doing woodworking, and others will need to spend considerable time in understanding the use and care of tools and in work on simple projects.

- Magazine holder
- Wall shelf
- Lamps
- Footstools
- Tool boxes
- Wall plaques

BIBLIOGRAPHY

1. Fryklund & Secrest -- *Materials of Construction*
2. Fryklund & LaBerge -- *General Shop Woodworking*
3. Groneman -- *Exploring the Industries*
4. Douglass & Roberts -- *Units of Hand Woodworking* 
5. Sowers -- *Woodcarving Made Easy*
EIGHTH GRADE SKETCHING

The purpose of this unit is to acquire ways of drawing and sketching which will be of general value to boys in their immediate activities, as well as forming a basis for the type of drawing and sketching which may form an important function in their lives.

SPECIFIC OBJECTIVES

1. To develop in the individual an appreciation of good drawing.
2. To develop in the individual a knowledge of how to read drawings.
3. To develop the ability of the individual in techniques of sketching.
4. To develop in the individual cooperation and good work habits involved in sketching.
5. To encourage the creative expressions of the individual.
6. To develop an appreciation and understanding of the planning phase of sketching.

LEARNING UNITS: How to--

1. Fasten drawing paper on drawing board
2. Select the right type of pencil for sketching
3. Hold pencil while sketching
4. Measure with a rule
5. Make witness marks with a pencil
6. Keep the drawing board neat and orderly
7. Use correct lines and symbols in making the drawing
8. Erase incorrect and unessential lines
9. Choose the necessary views of an object
10. Sketch a horizontal line
11. Sketch a vertical line
12. Sketch parallel lines
13. Sketch a drawing in correct order
14. Plan a drawing and make a layout of the sheet
15. Block out views of an object
16. Make a front, top and end view and know relationship of these
17. Sketch lines in correct order
18. How to label a sketch using script writing
19. How to sketch views with hidden edges
20. To estimate linear distances
21. To estimate angles
22. Sketch arcs and circles
23. Sharpen a pencil using a knife
24. Point a pencil using sandpaper
25. Draw dot arrowheads

THINGS THE STUDENT SHOULD KNOW

1. Methods of fastening paper to board
2. Methods of refastening paper if necessary
3. How to choose the necessary views of an object
4. How to arrange the lighting in order to protect the eyes
5. How to care for sketching equipment

SUGGESTED PROJECTS

A booklet of several sketches
A ground plan of school plant
Sketches of several objects
Sketches of football field
Sketch of basketball court

BIBLIOGRAPHY

1. Badger -- Introduction to Applied Drawing
2. Berg -- Mechanical Drawing
3. Fryklund -- General Drafting
4. Roberts -- Beginning Mechanical Drawing
EIGHTH GRADE LEATHERCRAFT

The purpose of this unit is to study the use of leather in our everyday living. Methods of treating skins, the tanning processes, the embossing of design and to have the student gain an understanding and appreciation of the different kinds of leather in his everyday living.

Activities and projects listed in this unit are merely suggestive and it is not to be inferred that all students must participate in all of these experiences.

SPECIFIC OBJECTIVES

1. To develop an appreciation of good designs and workmanship in leather craft.

2. To develop a knowledge and appreciation of good tool techniques in leather craft.

3. To develop a knowledge of tools used, kinds and characteristics of leather being tooled.

4. To develop habits of safety in leather tooling operations.

5. To encourage creativeness in design of projects.

LEARNING UNITS: How to--

1. Fill out a planning sheet
2. Read a working drawing
3. Layout templates on leather
4. Mark leather using creasing tool
5. Cut leather using cutting tool
6. Transfer designs to leather
7. Prepare leather for tooling and stamping
8. Groove lines
9. Lower background
10. Stipple background
11. Dye parts of design
12. Incise leather designs
13. Shade with shading stamp

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14. Stamp backgrounds
15. Model with modeling stamp
16. Embellish design with various stamps
17. Crease edges
18. Bevel edges
19. Punch holes for lacing using thonging tools
20. Perform lacing operations:
   a. Splice lace
   b. Whip stitch lace
   c. Button hole stitch
   d. Cordovan lace
21. Sew leather by hand
22. Rivet leather with eyelets
23. Rivet leather with split rivets
24. Set snap buttons on leather
25. Clean, preserve and polish leather
26. Assemble leather parts using adhesive

THINGS THE STUDENT SHOULD KNOW

1. The uses we make of leather in our homes
2. How leather is sold
3. Kinds of lining leathers
4. Types of tools used in leathercraft
5. Identify kinds of leather working tools

SUGGESTED PROJECTS

Wrist band
Belt
Comb case
Whistle lanyards

Key containers
Billfold
Coin purses
Book markers

BIBLIOGRAPHY

1. Bang -- Leathercraft for Amateurs
2. Cherry -- General Leathercraft
3. Hoefer -- Designs for Tooled Leather
4. Cramlet -- Fundamentals of Leather
5. Hoefer -- Designs for Carved Leather
EIGHTH GRADE ELECTRICITY

The instruction units which follow represent valid content for a course in basic electricity. Even so, it is expected that the list will be considered inaccurate and that instructors will find it advisable to omit or add to the list to meet local needs and conditions.

SPECIFIC OBJECTIVES

1. To provide for information concerning sources and uses of electricity.

2. To develop in the student habits of personal and group safety in use of electrical appliances and electricity.

3. To develop an appreciation of good workmanship in electricity.

4. To perform simple electrical construction and repair work.

LEARNING UNITS: How to--

1. Remove insulation using a knife
2. Cut wire with pliers
3. Form eyes in wire using long-nosed pliers
4. Strip wire using a wire stripper
5. Make a branch tap splice
6. Make a western union splice
7. Wire two bulbs in a series
8. How to tie an underwriters knot
9. Install a bell ringing transformer
10. Make a plan of procedure for doing the job
11. Solder and tape a splice
12. Uncoil wire without twisting
13. Connect dry cells in series
14. Connect dry cells in parallel
15. Plan and construct a simple electric circuit which may be closed and opened at one point
16. Attach a cord to a lamp socket
17. Test and replace fuses
18. Administer first aid in case of shock
THINGS STUDENTS SHOULD KNOW

1. Safety rules in working with electricity
2. Sources of electrical current
3. How electric current is conveyed
4. Kinds of conductors and uses
5. Meaning of volt, ampere, and watt

BIBLIOGRAPHY

1. Dragoo -- Applied Electricity
2. Wheeler -- Applied Electricity
SUGGESTED EQUIPMENT LIST FOR CRAFT AREAS

Woodcraft

Auger bits
Bench stop
Brace
Can, oil waste
Chisels
Clamps
Countersink, rose
Dividers
Drills
Duster, bench
Expansion bit
Files
Gauge, auger bit
Glass Cutter
Gauge, marking
Grinder, 2 wheel, pedestal

Plastics

Back saws
Buffing wheels
Chisels
Clamps
Drill, hand
Dies
Die stock
Drills
Files
Hacksaw
Hand screw clamps

Sketching

Boards, drawing
Brushes, drawing board
Erasing shields
Paper cutter
Protractor

Grinding wheel dresser
Hammers
Knife, sloyd
Knife, putty
Mallets, wood or rubber
Nail sets
Oil can
Planes
Pliers
Rule
Sandpaper
Saw
Scrapers
Screwdrivers
Slip stone
Square
Wrenches

Hammer, ball peen
Over for heating
Polishing head
Sandpaper
Screwdriver
Saws
Squares
Scratch awl
Taps
Tap wrench
Vise

Scales
Pencil
Paper
Stools
Tables

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### Electricity
- Side cutter pliers
- Diagonal cutter pliers
- Round nose pliers
- Wire stripper
- Screw driver
- Tape
- Wire
- Staples
- Bells or buzzers
- Buttons, push
- Batteries

### Metal Crafts
- Awls
- Chisels
- Dividers
- Drill, hand
- Drill, press
- Drills
- Files
- Grinder
- Emery cloth
- Hammers
- Mallet
- Punches
- Saws
- Snips
- Square
- Stakes
- Anvils
- Vise

### Leather Craft
- Skiving knife
- Tracers
- Modelers
- Ball tool
- Deerfoot
- Snap attaching set
- Eyelet setting punch
- Edge creaser
- Mallet
- Steel square
- Steel stamps
- Revolving punch
- Chisels

### Keene Cement
- Bowls
- Pans
- Forms
- Plane
- Sandpaper
- Screw driver
- Wax
BIBLIOGRAPHY


Cornetet, W., Principles of Electricity, McKnight Publishing Company, Bloomington, Illinois.


Jones, E. W., General Electricity, McKnight Publishing Company, Bloomington, Illinois.

APPENDIX II
VISUAL AIDS

**Motion Picture Films**

The films and filmstrips listed below have been selected for use in connection with the teaching of seventh and eighth grade industrial arts courses. Exact time to be used is left up to the instructor in charge.


   This film is very good for beginners in shop work. It explains the terms such as cut, and illustrates very effectively enlarged illustrations of files of one cut as compared to another. Method of filing is illustrated.


   This film offers material suitable for an overall view. The amount of leisure time we have today is compared to that of fifty or one hundred years ago. It should be helpful as a guide in developing a constructive attitude toward leisure-time activities.


   This film illustrates basic sheet metal forming operations on extra large forming blocks. Proper methods of bending metal are shown and the results of poor bending is illustrated.

4. *Hand Sawing*, Jam Handy, 11 min.

   The operation, care, and proper use of the rip, crosscut, coping, and hack saw is well illustrated. A unique method of explaining the cutting action of saws is well put.

5. *From Trees To Lumber*, American Forest Prod. Indu., 14 min., $2.00

   This film follows the manufacture of lumber from seedling to saw log and through the mill. Stresses need for sound forest management to guarantee future supply.
6. **Story of Plywood**, Bailey, 10 min., $2.00

The story of the manufacture and use of Douglas fir plywood. Common uses of plywood are included.

7. **Kingdom of Plastics**, General Electric, 10 min., color.

Illustrates the properties and uses of plastics.

8. **Drawing For Beginners**, Young America, 11 min., $45.00


9. **Art of Leather Carving**, Portafilms, 20 min., $90.00

Smith, a leading craftsman and teacher of leather art, demonstrates his skills of carving designs in leather.


Explains voltage, current, resistance, direct and alternating current, magnetic fields, induction, series and parallel circuits, etc.

11. **Electricity**, Gateway, 10 min., $2.50

Illustrates where electricity comes from and what it does for us.


Illustrates through a character called "primitive pete" the right and wrong of using tools.

**Filmstrips**

1. Play Safe and Work Safely -- Jam Handy

2. Hand Tools-Hammers, Saws -- Jam Handy

3. Planes, Bits, Knives, Chisels, Screw drivers, Files

4. Laying Out, Cutting, Filing and Drilling -- Charles Bennett Co.
JUNIOR HIGH SCHOOL INDUSTRIAL ARTS

Student Planning Sheet

Directions

1. Make sketch of project.
2. Work out bill of material.
3. Work out plan of procedure.
4. Get instructor's O.K.
5. Get cost card checked by record clerk.
7. Complete project and hand in this sheet with project for grading.

Name ____________________________
School ________________________
Grade _______ Section _______
Project ________________________
Date started ____________________
Completed ______________________
Score _________________________

O A C

1. Make sketch of project here - put on all dimensions.

O.K.
### 2. Bill of Material

<table>
<thead>
<tr>
<th>Material</th>
<th>No. Pcs.</th>
<th>TWL</th>
<th>Units or How Sold</th>
<th>Cost Per Unit</th>
<th>Cost</th>
<th>Notes</th>
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**Record Clerk**__________ **Supply Clerk**__________ **Total Cost**

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### 3. Plan of Procedure

<table>
<thead>
<tr>
<th>No.</th>
<th>Steps</th>
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</table>

**O.K.**
T F 1. Sheet plastic is usually covered with masking paper to protect the surface from scratches.

T F 2. Before drilling plastic, we use a punch to mark the exact spot for the hole to be drilled.

T F 3. Plastic is so hard that there is very little danger of it becoming scratched.

T F 4. When transferring a design to plastic, it is best to remove the masking paper and trace the design directly on the plastic.

T F 5. Pleximent is used to cement tracing paper to plastic.

T F 6. It is much better to cut a small object from the center of a large piece of plastic than from the corner or the edge.

T F 7. A try-square is sometimes used to lay off lines on a piece of plastic.

T F 8. Plastic is never cut on the jig saw.

T F 9. The hole for the key chain was drilled with the hand drill.

T F 10. A try-square is sometimes used to test the edge of a piece for squareness or straightness.

T F 11. The saw-jack is used mainly for putting saw blades in the coping saw.

T F 12. The hack saw is sometimes used for cutting plastic.

T F 13. Bracelets are made by heating the plastic and forming it around some round object.

T F 14. The plastic you used for your bracelets can be heated and shaped only once.

T F 15. The material used for rings is much easier to file than that used for letter openers.

T F 16. Plastic is made in only one color, and that a clear, water color.

T F 17. Both the drill press and hand drill were used for drilling holes in the toothbrush holder.

T F 18. Large rough surfaces are smoothed down with the polishing wheel.
T F 19. Objects to be buffed and polished are held on top of the buffing and polishing wheels.

T F 20. A piece of plastic glued or fastened on top of another piece is called an overlay.

T F 21. We always file across the narrow edge of a piece of plastic to remove saw marks.

T F 22. The teeth of the coping saw blade should point toward the handle.

T F 23. The coping saw blade cuts on both the push and pull strokes.

T F 24. The sheet plastic you have been using is sold by the square inch.

T F 25. The planning sheet, when properly filled out, tells each step to follow while making a project.

Fill in the blank space with the correct word or words:

1. Most sheet plastic is covered with __________ paper.

2. Almost all of your sawing was done with a __________ saw.

3. __________, __________, and __________ are used to smooth or remove rough edges from plastic.

4. __________ cement is used to cement tracing paper to plastic.

5. Following the file, we use __________ to remove scratches and saw marks from plastic.

6. Plastic must be __________ before it can be bent or shaped.

7. Plastic can be fastened together with __________ and __________.

8. Before starting a new job in plastics, a __________ __________ must be filled out.

9. We use an __________ to heat plastic for making bracelets.

10. Five tools used with plastics are: