Name: Ronald R. Vandever Date of Degree: January, 1961

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Title of Study: A PROPOSED COURSE OF STUDY FOR A BEGINNING TENTH GRADE WOODWORKING CLASS

Pages in Study: 58 Candidate for Degree of Master of Science

Major Field: Industrial Arts Education

Scope of Study: Included in this report is a brief history of the development of the industrial arts program from its early beginning to the present time. This information consists of the philosophies of the movement, the leaders who contributed to the development of the program, and the objectives on which the program has been established. The body of the report consists of a course of study developed through the use of the instructor's guide sheets. These guide sheets outline each lesson for a step by step presentation. Included with the presentation is the method of presentation and the teaching devices with additional references for each presentation. Each guide sheet is concluded with the next assignment. This course of study is proposed to meet the needs of a beginning tenth grade woodworking class.

Findings and Conclusions: These instructor's guide sheets are intended to be flexible enough to be used individually when the need arises or as a part of the course of study, but no matter how they are used they must keep abreast with our advancing society and should be revised whenever necessary to meet the educational needs of the students and to fulfill the objectives of the program.

ADVISER'S APPROVAL A. R. Hill

A PROPOSED COURSE OF STUDY FOR

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By

RONALD R. VANDEVER

Bachelor of Science

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REPORT APPROVED:

C. L. Hill

Report Adviser and Head,
Department of Industrial Arts Education

L. H. Brighton

Associate Professor,
Department of Industrial Arts Education

Robert Madison

Dean of Graduate School

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R. R. V.

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CHAPTER I

Introduction

Since wood is one of the more abundant resources and because a majority of the household furnishings are constructed of wood it seems only fitting that the students should be introduced to woodworking.

Many articles can be constructed in the woodworking shop which will enhance the beauty of the home, serve as a process for learning industrial methods, and develop future consumers knowledge.

Woodworking, as a part of the general education curriculum, should emphasize the development of desirable working habits, the understanding of industry and its part in our culture, the development of problem solving techniques, and the development of some skill in the use of the common tools and machines.

Purpose of the Study. This study is planned to serve as an aid to the writer in helping to organize the course material into an orderly step by step procedure for classroom presentation. It is the hope of the writer that through the use of the step by step presentation of the lesson content the hit and miss type of presentation will be eliminated.

The Problem Stated. The scope of the problem is to develop an adequate course of study through the use of the instructor's guide sheets. This course of study must be applicable to beginning tenth grade woodworking students and must be based upon the objectives of the industrial arts program.

Research Technique Used. The contents of this report will be obtained from books, magazines, bulletins, and reports found in the Oklahoma State University library. Additional information may be obtained from the industrial arts library at Oklahoma State University and from the personal library of the writer.

Definition of Terms. In order to gain a better understanding of the terms used in this report it is necessary to define them at this time as such.

> Manual Training. A historical term describing education of the mind through the hands based on work instructions in the elementary industrial processes and the theory of formal discipline. It was offered originally for general educational value without regard to vocation and usually applied to the training of boys. (10, page 6)

> Manual Arts. The term came into use to express emphasis on the art side of manual training. In 1893, this term was used at Teachers College, New York City, to designate a building expressly for art and manual training. (4, page 441)

> Industrial Arts. Industrial arts is the study of materials and of the desirable changes made by hand or by several manufacturing processes from the raw state into products designed to meet the consumer's needs and comforts for daily living. (9, page 5)

> General Education. For practical purposes the term implies three basic principles: (1) to transmit a way of life, (2) to improve and reconstruct that way of life, and (3) to meet the needs of individuals. (13, page 3)

The Plan of the Report. Chapter two will be devoted to the history and philosophy of industrial arts from the early beginning to the present time. It includes the early leaders in the field and their contributions. Also, chapter two will contain the formulated objectives of industrial arts. Chapter three contains a course of study for a beginning tenth grade woodworking class. It contains the objectives for each lesson, presentation of the material, and the techniques and devices for presentation. Chapter four will give the summary and recommendations of the author.

In order to develop an adequate course of study for a beginning tenth grade woodworking class it will be necessary to review the past happenings during the development of the industrial arts program and the objectives of the program that determine the content of each lesson. This material will be covered in Chapter II of this study.

CHAPTER II

HISTORY AND PHILOSOPHY OF INDUSTRIAL ARTS

Before entering into a study of the present day industrial arts program a review of the past becomes necessary so that one may better understand how the present program was developed. The material in this chapter deals with the periods which influenced the movement, the leaders who contributed to the development, and the objectives on which the present program is based.

PART A

Early History of Industrial Arts

The ideas of industrial arts dates back beyond the time of recorded history. Primitive man was the first to use his hands in order to overcome such environmental conditions as, providing food, clothing, and shelter for his family. By overcoming these conditions primitive man learned the unskilled use of his hands and tools.

The education of the primitive man came about by the unconscious imitation of the father and advanced slowly, until man was able to control fire. By the use of fire man was able to smelt metals and form them into tools. With this new development began the divisions of labor. Men with common experiences were drawn closer together. Imitation became apparent, but never at any time did primitive man use

the process of instruction. By handing processes and tools from generation to generation, one arrives at the development of industrial arts.

Religious Development. The value of handwork was recognized by the ancient Jews. The motives of the Jewish education was twofold, first came instruction in the religious laws, and second was the instruction in a trade or vocation. During the morning the boy went to school and was taught by the Rabbi, and in the afternoon he remained at home and learned the trade of his father. The fathers were bound to such training by the Talmud, the book of traditionary laws of the Jews, which states: "As it is your duty to teach your son the law, teach him a trade." (3, page 13.) The father's duty to his son and the society was further established by the following statement: "He who does not have his son taught a trade prepares him to be a robber." (3, page 13)

Development of Apprenticeship. Up to the nineteenth century the majority of the people received very little formal schooling. The education of most persons was derived through their trade and occupational experience.

The apprenticeship usually covered a period of seven years. These seven years were served in the homes of master craftsmen. The master craftsman was to give to the apprentice the same moral, religious, and civic instruction that he would have given to his own son in teaching him to master the craft.

Although the apprenticeship system was the forerunner to the trade school, it would be a mistakable thought to compare the apprenticeship instruction to modern courses in the technology of a trade.

Russian System. In 1868, Della Voss introduced this system into the Imperial Technical School at Moscow. The system had a practical purpose for training engineers and builders to work as a group rather than as individuals.

The instruction was based upon a series of exercises, which had been determined by an analysis of the trade. The majority of the exercises consisted of various types of joint construction, which would be used in the actual construction of some object.

Swedish Sloyd. Otto Salomon has been given credit for the development of the Sloyd system. In 1872, Salomon established a school at Naas, to instruct the youth in the making of the products that were to be produced for the market.

Salomon focused his attention on the making of useful objects, analysis of operations, and educational methods. With the aid of these offerings the Sloyd system began spreading to other parts of the world.

PART B

Industrial Arts in America

Industrial Arts, as it is known today, was derived from two European systems, the Swedish Sloyd and the Russian system.

The present day industrial arts were brought into existence through the efforts of C. M. Woodward and Dr. John D. Runkle. These two men expressed the need for industrial handwork to be placed in the American educational system. Known as manual training in the beginning, the courses of handwork were based upon the common crafts of the day.

Morrill Act of 1862. One of the most important pieces of educational legislation to ever be passed was the Morrill Act of 1862. The

bill was introduced in December of 1857, it passed the House but failed the Senate. Again in 1859 the bill was introduced and passed both houses, but was vetoed by President Buchanan. Finally the bill was passed and was signed by Abraham Lincoln on July 2, 1862.

The terms of this legislation granted to several states an amount of public land equal to 30,000 acres of public land per senator and representative in Congress. These grants were to be used for the purpose of establishing colleges of agriculture and mechanical arts. The following is quoted from the act:

> The money derived from the sale of these lands was to be appropriated to the endowment, support and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach some branches of learning as are related to agriculture and the mechanical arts, in such manner as to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life. (1, page 152)

Adoption of the Russian System. The development of Manual Training in America had its beginning at the Centennial Exposition at Philadelphia in 1876. While viewing the Russian system of tool instruction Dr. Runkle stated:

> In an instant the problem I had been seeking to solve was clear to my mind; a plain distinction between a mechanical art and its application in some special trade has become apparent. (4, page 320)

Upon his return, Dr. Runkle made the recommendation that a series of instruction shops be made available for the students at the Massachusetts Institute of Technology. His suggestion was carried out and the equipment was being installed by 1877.

In his report to the Board of Education of Massachusetts for 1877-78, Dr. Runkle said this of the Russian System: "The method is

not only educational, but it constitutes the only true and philosophical key to all industrial education." (4, page 321)

It was Runkle's discovery of the Russian System and his plan for utilizing it not only in the field of engineering, but also in general education, which marked the beginning of the manual training movement in America.

Adoption of the Sloyd System. Due to the failure of the Russian System to keep the interest of the students, the Sloyd System was proposed to take the place of the earlier Russian System. John Ordway was the primary spokesman for the adoption of the Sloyd System.

It was in 1888 when the Sloyd Training School was established at Boston by Mrs. Quency Shaw. The activities of the school were directed by Gustaf Larsson, a former pupil of Salomon. Larsson emphasized what he called "duality of progression". (4, page 432) By this he meant that exercise should follow in a progressive order from simple to complex and be carefully graded with reference to the power of both mind and hand. Larsson also contended that exercises should be grouped and taught in such a way as to result in making of a useful article.

With the adaptation of the Sloyd system and the Russian System in America, the stage was set for the Manual Training movement, which was to follow shortly.

Manual Arts Movement. Under the sponsorship of Charles A. Bennett, Ira S. Griffith, William E. Roberts, Dr. William T. Bawden, Robert W. Selvidge, and Frank M. Leavitt, manual training was broadened to manual arts and taught as a form of general education.

The ideas of this movement were the development of the pupil through work in the school shop, appreciation of good design, and construction of a variety of exercises and practical projects of personal value. Manual Arts placed the emphasis on the aesthetic approach to handwork. This term remained popular until the term "Industrial Arts" was introduced.

Industrial Arts in General Education. The term "Industrial Arts" was originated between 1909 and 1911. The objective of this movement was to include Industrial Arts as a part of general education, not a special subject. The acceptance of Industrial Arts as an integral part of the general education has offered a learning experience to those who participate by offering a better understanding of the industrial and technical aspects of today's daily living.

Industrial Arts is playing a vital role in the advancement and understanding of today's highly industrial and technical society. This program, for the most part, has been accepted as a means of introducing the student to the material conditions of life.

Trend Toward the General Shop. The idea of the general shop was brought into existence in 1925, but did not gain support until the mid thirty's. This program was developed for the purpose of presenting a wider variety of areas to the students for exploration purposes.

Today's Trend of Industrial Arts. Today, with more emphasis being placed upon science and mathematics, the industrial arts program has been confronted with the problem of what to do with the accelerated students.

PART C

Contributions of Leaders in the Development of Industrial Arts in America

Many times it becomes necessary for one to review past events in order to gain intelligent insight into the future. Through the information presented it is hoped that one will become familiar with the problem which faced the early leaders. With the understanding of the problems, which previously existed, one may be better prepared to cope with the problems that confront the present day teacher.

There have been many men contributing to the successful development of industrial arts. Calvin Woodward and John Runkle were influential during the late 1800's in beginning the manual training period. In the early 1900's Charles Richards and Frederick Bonser contributed strongly to the industrial arts movement.

Calvin M. Woodward. Woodward has often been referred to as "the great American champion of manual training". (4, page 317) He led the way in determining the early form and content of shopwork organized for instruction and methods of teaching, also, in arousing interest on the part of educators as well as the public.

While teaching a class in applied mechanics at O'Fallon Institute he decided to have the students construct models that would illustrate the various mechanical principles involved. However, due to the lack of skill and knowledge of tools, the students were unable to construct the simplest object with the tools. It was this incident that prompted Woodward in the teaching of shopwork. Shortly after this incident the college catalogue listed scheduled courses in woodwork construction for college students enrolled in applied mechanics.

new approach of the curriculum of elementary schools. Bonser recognized the need for industrial arts and proceeded to do something about it.

One of the most popular contributions of Bonser's was defining the term industrial arts. He based his definition upon sound reasoning and thorough knowledge of the child and the school. Bonser defined industrial arts as follows:

> The industrial arts are those occupations by which changes are made in the forms of materials to increase their value for human usage. As a subject for educative purposes, industrial arts is a study of the changes made by man in the form of materials to increase their values, and of the problems of life related to these changes. (5, page 5)

This definition of industrial arts has been more widely quoted than any other in the history of the movement. This definition made a strong appeal to school administrators because of the emphasis placed on content and the contribution and support of other school subjects. The definition was not the sole influence in the development of industrial arts, but it did introduce a new approach to the subject.

PART D

Objectives of Industrial Arts

Prominent leaders in the field of industrial arts have set forth certain objectives of industrial arts which relates to its being a part of general education. Each set of objectives are arrived at by an individual or committee as their beliefs and ideas according to the need.

The objectives which follow are those of prominent leaders in the field of industrial arts, the Oklahoma State Advisory Committee for Industrial Arts, and a survey conducted to determine the importance of the objectives and in order of those listed by the State Advisory Committee for Industrial Arts.

Wilber's Objectives. The list of objectives which follows was selected by Wilber to show the relationship of industrial arts to general education.

1. To explore industry and American industrial civilization in terms of its organization, raw materials, processes and operations, products and occupations.

2. To develop recreational and vocational activities in the area of constructive work.

3. To increase an appreciation for good craftsmanship and design, both in the products of modern industry and in artifacts from the material cultures of the past.

4. To increase consumer knowledge to a point where students can select, buy, use, and maintain the products of industry intelligently.

5. To provide information about, and-- in so far as possible-- experiences in the basic processes of many industries, in order that students may be more competent to choose a future vocation.

6. To encourage creative expression in terms of industrial material.

7. To develop desirable social relationships, such as cooperation, tolerance, leadership and followership, and tact.

8. To develop safe working practices.

9. To develop a certain amount of skill in a number of basic industrial processes. (13, pages 42-43)

Warner's Objectives. In order to list the objectives that would best suit the need, Warner made a study of the objectives which had been used in the past. From the information obtained he listed fifteen specific purposes that would meet the needs of the student. They are as follows:

A. Exploration

B. Educational guidance

C. Vocational guidance

D. Consumer's knowledge and appreciations

E. Household mechanics

F. Social habits and attitudes

G. Pre-vocational purposes

H. Avocational purposes

I. A degree of skill

J. The seven cardinal principles

K. Mechanical intelligence

L. Correlation with other subjects

M. Developing the "faculties"

N. Coordinating the "hand and eye"

O. Vocational training (12, page 34)

Newkirk's Objectives. Newkirk listed his objectives for relating industrial art to general education as follows:

1. Develop the ability to plan and complete projects using a variety of tools and construction materials in a workmanlike manner.

2. Give experience that will increase understanding of modern industry that will lay the foundation for and help determine vocational interest.

3. Develop the ability to read and make working drawings, charts, and graphs.

4. Develop the ability to recognize quality and design in the products of industry.

5. Develop the ability to maintain and service in a safe and efficient manner the common products of industry.

6. Provide an objective medium for expression in mathematics, science, language, art, and social science.

7. Develop an interest in crafts as a valuable medium for creative expression in leisure time.

8. Give experiences that will develop social understanding and ability to work effectively with others either as a leader or as a member of the group. (9, pages 270-272)

State Industrial Arts Advisory Committee. In 1948, the Oklahoma State Industrial Arts Committee listed the following objectives for industrial arts as a part of general education.

1. Industrial arts is complementary to other school subjects and provides opportunities to apply knowledge learned in other school subjects.
2. Develops an appreciation of applied knowledge and skills.
3. Provides a knowledge of industrial drawing, the language of industry, and methods of expressing ideas by means of drawing.
4. Contributes to latter vocational efficiency.
5. Stimulates student's knowledge and appreciation of good design.
6. Instills a satisfaction in personal creative achievement.
7. Develops the ability to analyze a job into its processes and organize them into correct procedure.
8. Contributes to consumer knowledge and induces an appreciation of the value of industrial materials and the need for their conservation.
9. Trains in industrial and home safety (including fire prevention).
10. Acquaints students with industrial information and induces a recognition of the standards of industrial attainment.
11. Develops avocation interests.
12. Trains individuals to be more resourceful in dealing with the material problems of life.
13. Stimulates correct attitudes toward an orderly shop and home and their environment.
14. Aids in making vocational choices.
15. Develops qualities of leadership.
16. Develops cooperative attitudes in work habits.
17. Develops an appreciation of the dignity and importance of the occupation of one's neighbor. (14, page 3)

Objectives Obtained from a Survey by Frank Daniel Keck. This survey was conducted in 1960 to determine the most important objectives formulated

by the State Industrial Arts Advisory Committee in 1948. The following eight objectives were obtained from the survey and are listed in order of importance.

1. Industrial arts is complementary to other school subjects and provides opportunities to apply knowledge learned in other subjects.
2. Develops an appreciation of applied knowledge and skills.
3. Develops the ability to analyze a job into its processes and organize them into correct procedure.
4. Provides a knowledge of industrial drawing, the language of industry, and methods of expressing ideas by means of drawings.
5. Instills a satisfaction in personal creative achievement.
6. Contributes to latter vocational efficiency.
7. Stimulates student's knowledge and appreciation of good design.
8. Contributes to consumer knowledge and induces an appreciation of the value of industrial material and the need for their conservation. (16, pages 35-36)

Schmitt's Objectives. The U. S. Office of Education called a conference in Washington, D. C., June, 1960, which was directed by Marshall Schmitt, Specialist for Industrial Arts. The theme for the conference was Improving Industrial Arts Teaching in the Public School. Through the efforts of Schmitt and a group of leaders from the field of industrial arts four general objectives for the program were proposed. These objectives are the aims of all industrial arts programs, making it necessary for the individual to formulate specific objectives to meet the needs of different courses, age groups, and the accelerated or slow learner. The four general objectives are as follows:

1. To develop in each student an insight and understanding of industry and its place in our culture.
2. To discover and develop talents of students in the technical fields and applied sciences.

3. To develop technical problem-solving skills related to materials and processes.

4. To develop in each student a measure of skill in the use of the common tools and machines. (15, page 5)

Each teacher must establish definite objectives for the course and strive to achieve them by planning in advance a lesson with this one purpose in mind.

Chapter III is a proposed course of study for a beginning woodworking course, constructed around the instructor's guide sheets that determine the objectives for each lesson and a plan for achieving the objectives.

CHAPTER III

PROPOSED COURSE OF STUDY

This chapter is written as an aid to the shop instructor. It contains a set of instructor's guide sheets which are to be used in presenting the subject material to the students. These guide sheets will serve as an aid in helping to put the lesson over in an orderly sequence. These guide sheets are based on the four step method of teaching, preparation, presentation, application, and testing. However, since no two people would apply the material in the same manner or use the same type test to check the results of the lesson these two steps have been omitted and will be left up to the individual to develop the steps to fit his particular situation.

Instructor's Guide Sheet. These sheets are for the purpose of directing the instructor through a definite plan for the presentation of the subject matter. These sheets contain suggestive references, aids, methods, and techniques for presenting a lesson according to the best teaching form.

Preparation Step. The presentation step will consist of two parts. The first part is for the teacher in preparing himself to present the material to the class. The second part of the preparation step consists of preparing the students to receive the material being offered as a lesson.

Teacher Preparation. This part of the preparation is not just a review of the material to be presented, although this should be included, the the instructor must decide on what method is to be used in presenting the material to the students. Also, he must include all the necessary tools and materials needed in presenting the lesson, make the arrangements for providing the material and equipment needed by the students, and see that the proper physical conditions exist so that the best learning situation will take place. All preparation should be determined before presenting the material to the students.

Through advanced planning the instructor is able to present the material in an orderly sequence in which the most meaningful learning situation will take place.

Student Preparation. The second part of the preparation step is preparing the students to receive the instruction. In preparing the student, he must first be motivated to the point where he will give his utmost attention. After securing the learner's attention, it becomes necessary for the learner to develop an interest in the lesson. Through gaining the attention and interest of the learner a desire to learn should have developed within the learner.

After the student's desire to learn has been developed, he is ready to receive the instruction. The next step is the presentation of the material.

Presentation of the Material. At this point it becomes necessary for the instructor to show the learner how to perform the skills in which he is being introduced, or he makes clear to the student the facts, ideas, and relationships which the learner seeks to understand.

There are many effective ways to present the new skills and information to the learner. One of the most effective methods is through the use of the demonstration. The demonstration consists of showing the learner how the new skill is performed. In this situation the teacher does the showing and the learner observes. The explanation method is used to make clear to the learner what he is expected to know. When using this method one must be careful not to talk over the heads of those who are receiving the explanation. The use of pictures, models, and diagrams may be used to supplement a demonstration or explanation, by using illustrations one is able to clarify many difficult points. The motion pictures and the film strips are also useful as supplements to demonstrations, but it must be remembered that these aids are no substitute for the classroom demonstration or for the instructor.

When selecting a method for presenting a point, it must be remembered that a method will be ineffective unless it is used correctly.

Application Step. This is the step where the learner attempts to apply what has been demonstrated to him by the instructor. The application of the lesson is the first opportunity for the learner to put into use the ideas which have been gained from the presentation.

While the application step is being carried on, the instructor must be available to offer assistance, suggestions, and help to the learner when the need arises. Through suggestive assistance and practice the learner may accomplish the desired results of the lesson. However, it must be remembered that the application step must follow the presentation closely or the learner will lose sight of the most important details. During the application step it would be wise for

the instructor to provide the learners with job and operation sheets for the purpose of helping to guide the learner through the application steps.

Testing Step. The most helpful step to both the instructor and the learner, in determining whether or not the objectives of the lesson have been accomplished, is the testing step. The objective of every lesson is the mastery of the skills or knowledge in the lesson. However, the extent of the students' accomplishments will never be realized unless the testing step is used to check the results. Also, the effectiveness of instructor's procedure in presenting the lesson in a manner which is easily grasped by the learner can be checked by the evaluation of the students' test.

By the use of the testing step in its true relationship to the learning process, the learner will welcome it as an aid toward achieving the objective of the lesson and the instructor will welcome it as a teaching device for checking the effectiveness of his teaching. 1

This course of study is constructed around the textbook entitled, General Woodworking, by Chris Groneman. Information which may be of additional aid to the teacher is referred to as numbers 1, 2, 3, and 4 followed by the page number. These numbers represent the name of the books in which the information may be found.

No. 1 -- General Woodworking, by Chris Groneman

No. 2 -- Hand Woodworking, by DeWitt Hunt and John Tate

No. 3 -- Mechanical Drawing, by Thomas French and Carl Svensen

No. 4 -- Machine Woodworking, by Herman Hjorth

INSTRUCTOR'S GUIDE SHEETS

No. 1

Job or subject: Introduction to Class

Objectives: To acquaint the students with the shop routine.

I. **Introduction or preparation:** Today we want to become acquainted with each other, and outline the duties of each in this shop. Also, I will outline what is to be expected of each student.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Call class roll	
II. Outline course objectives	Oral Explanation
A. To provide a knowledge of the woodworking industry.	
B. To teach the proper use of tools and materials.	
C. To develop a degree of skill in woodworking.	
D. To provide an opportunity for creative expression.	
E. To develop patterns for solving problems.	
F. To develop an appreciation of good design, materials, and workmanship.	
G. To provide a knowledge of materials and processes related to wood.	
H. To develop a sense of leadership and group cooperation.	
III. Outline general shop safety	Explanation
IV. Acquaint students with the shop	Tour
V. Assignment of shop personnel	Explanation
A. Superintendent	
B. Tool clerk	
C. Finish room foreman	
D. Clean-up foreman	

Reference:

Assignment: Unit 35 of text, pp. 143-147

INSTRUCTOR'S GUIDE SHEETS

No. 2

Job or subject: Trees and Forests

Objectives: To acquaint the students with the structure of the tree, the drying processes, and the method of cutting.

I. **Introduction or preparation:** Many students use wood and never stop to realize how the tree has developed to the point when it becomes so useful to them. Also, they don't understand how the lumber is dried or how it is cut for the most useful purpose.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Growth and structure of the tree	Explanation, Demonstration, Illustration
A. Growing parts	1, pp. 143
1. Buds	
2. Roots	
3. Tips	
4. Cambium	
B. Structure	Illustrations
1. Bark	1, pp. 144
2. Cambium	
3. Sapwood	
4. Heartwood	
5. Annular rings	
6. Medullary rays	
7. Pith	
II. Drying processes	Explanation
A. Air drying	2, pp. 28-30
B. Kiln drying	
C. Moisture content	
III. Methods of cutting	Illustrations
A. Plane sawed	1, pp. 144
B. Quarter sawed	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 36 of text, pp. 147-157

INSTRUCTOR'S GUIDE SHEETS

No. 3

Job or subject: Common Woods

Objectives: To acquaint the students with the different classifications of wood and to acquire some knowledge of the different types of wood used in the shop.

I. **Introduction or preparation:** One must be familiar with the different types of wood because some uses require a specific type of wood. With this in mind we begin the study with the different types of wood.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Types of wood	Explanation
A. Hard woods	Samples
B. Soft woods	
II. Classification of woods	Explanation
A. Conifers	1, pp. 147
B. Deciduous	
III. Types of woods, characteristics, and where they are found	Explanation, samples
A. Ash	1, pp. 148-156
B. Basswood	
C. Beech	
D. Birch	
E. Cedar	
F. Chestnut	
G. Cypress	
H. Fir	
I. Gum	
J. Mahogany	
K. Oak	
L. Pine	
M. Poplar	
N. Walnut	

Reference:

Assignment: Unit 38 of text, pp. 164-170

INSTRUCTOR'S GUIDE SHEETS

No. 4

Job or subject: Use of Forest Products

Objectives: To acquaint the student with the products which are made from the forest and to introduce some of the industrial processes.

I. **Introduction or preparation:** As a result of scientific research many new applications are being found for forest products. Who can tell what discoveries will be made in the future.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Discovery of new products	Explanation 1, pp. 164
II. Veneers and plywoods	Explanation
A. Processing	Samples
1. Sliced	1, pp. 165
2. Rotary	
B. Construction	
III. Paper products	Explanation
A. Producing	Samples
B. Use	
IV. Insulation and fuel	Explanation
A. Types of insulation	Samples
B. Use as a fuel	1, pp. 167
V. Fabrics	Explanation
A. Rayon	1, pp. 169
B. Use	Samples
VI. Products extracted from wood	Explanation
A. Solvents	Samples
B. Sugar	1, pp. 169
C. Dyes	
D. Spirits	

Reference:

Assignment: Unit 40 of text, pp. 172-180

INSTRUCTOR'S GUIDE SHEETS

No. 5

Job or subject: Period Design in Furniture

Objectives: To acquaint the students with the different styles of furniture design used in the past.

I. **Introduction or preparation:** In order to design furniture for the future we must first study the design of the early periods.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Need for design	Explanations 2, pp. 1-2
II. Proportion of mass A. Ratio B. Dominant C. Subordinate	Illustrations 2, pp. 3-6
III. Balance	Explanation 2, pp. 7
IV. Period designs and characteristics A. Queen Anne B. Chippendale C. Adam D. Heppelwhite E. Sheraton F. Louis XIV, XV, and XVI G. Duncan Phyfe H. William and Mary I. Colonial J. Modern K. Contemporary	Explanation Illustrations Pictures 1, pp. 173-179 2, pp. 9-13
V. Designs for the future	Discussion

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 3 of text, pp. 4-7

INSTRUCTOR'S GUIDE SHEETS

No. 6

Job or subject: Purchasing and Measuring Lumber

Objectives: To present the terminology needed to figure the material bills.

I. **Introduction or preparation:** Each student must be able to figure his own material bills. Therefore, it will be necessary for each student to devote his utmost attention to today's lesson.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. What is a board foot	Explanation 1, pp. 6
II. How to figure board feet	Demonstration
A. When length is given in feet	$\frac{T'' \times W'' \times L'}{12}$
B. When length is given in inches	$\frac{T'' \times W'' \times L''}{144}$
III. Grades of woods used in the shop	Explanation
A. Soft woods, select and common, A-D	Samples
B. Hard woods, FAS, Select, and No. 1, 2, and 3 common	2, pp. 38
C. Surfaces, Rough, S2S, and S4S	
IV. Methods of drying lumber	Explanation
A. A.D. Air dried	1, pp. 162-163
B. K.D. Kiln dried	
C. Best method	Demonstration
V. Methods of sawing lumber	Illustration
A. Plane sawed	Samples
B. Quarter sawed	1, pp. 144

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 2 of text, pp. 2-4

INSTRUCTOR'S GUIDE SHEETS

No. 7

Job or subject: Understanding the Working Drawing

Objectives: To provide the students with the knowledge of how a working drawing is used, what it looks like, and how it is read.

I. **Introduction or preparation:** It is important that all shop personnel be able to read and understand the working drawing because in industry all working data must be interpreted from the working drawing.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Explanation of drawing	Explanation, Illustrations
A. Working drawing	1, pp. 3
B. Orthographic	3, pp. 64-67
C. Pictoral	2, pp. 53
1. Oblique	3, pp. 194-197
2. Isometric	3, pp. 187-190
II. Line symbols	Demonstration
A. Border	1, pp. 2
B. Object	
C. Hidden	
D. Extension	
E. Center	
F. Dimension	
III. Types of drawings for student projects	Explanation
A. Pictoral sketch	
B. 3-View orthographic	

Reference: French and Svensen, Mechanical Drawing, Hunt and Tate, Hand Woodworking

Assignment: Unit 4 of the text, pp. 7-9.

INSTRUCTOR'S GUIDE SHEETS

No. 8

Job or subject: Planning Your Procedure

Objectives: To develop the ability to think through the processes necessary for the completion of the project.

I. **Introduction or preparation:** It is necessary that each student approach his problem with a methodical analysis of the procedures necessary to obtain the desired results in a minimum of time and effort.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Selection of project	Explanation
A. Function	2, pp. 15-16
B. Design	
C. Construction	
II. Sketch of the project	Illustration
A. To determine what the project will look like when completed	
B. Type of construction required	
III. Scale drawing	Explanation
IV. Stock bill	Explanation
A. Determines the necessary material	2, pp. 55
B. Determines the cost of the project	
V. Plan of procedure	Explanation
A. Purpose	Illustration
1. List each step for completion of project	1, pp. 8
2. Presents an orderly plan	
B. Determines tools and processes	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 5 of text, pp. 9-12

INSTRUCTOR'S GUIDE SHEETS

No. 9

Job or subject: Safety

Objectives: To gain knowledge of the correct safety practices in the school shop.

I. **Introduction or preparation:** It will be necessary for each student to practice shop safety in order to eliminate all shop accidents and hazards.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Misuse of tools	Explanation
II. Care of tools	Demonstration
III. Reports of all shop accidents	Explanation 1, pp. 10
IV. Safety rules for all hand tools	Explanation
A. Physical	Demonstration
1. Test for sharpness on wood, not your hand.	1, pp. 11
2. Be careful when using your thumb for a guide when crosscutting or ripping.	
3. Always cut away from the body.	
4. Never place hands in front of sharp tools.	
B. Clothing	
1. Wear some type of protective clothing.	
2. Do not wear loose clothing.	
C. Tools	
1. Use tools only for their intended purpose.	
2. Fasten material securely in vise.	
D. General	
1. Keep scraps off the floor.	
2. No horse play in the shop.	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 8 of text, pp. 23-26

INSTRUCTOR'S GUIDE SHEETS

No. 10

Job or subject: Assembly and Adjustment of Planes

Objectives: To help develop the students skill in using the different types of planes and to develop an understanding of the working parts.

I. **Introduction or preparation:** In the future each of you will be using the plane on your project and it will be necessary to change the adjustment of the plane. Also, when sharpening the plane iron it will be necessary that you know the working parts of the plane.

II. **Presentation:**

Teaching Outline	Teaching techniques, Aids and Devices
I. History of the plane	Explanation 2, pp. 9-10
II. Descriptions of different type planes A. Jack B. Smoothing C. Fore D. Jointer E. Rabbet	Explanation Illustration 1, pp. 23-24
III. Disassemble the plane A. Name of each part B. Function of each part	Demonstration 1, pp. 23
IV. Assemble the plane A. Relationship of plane iron cap to the plane iron. B. Relationship of plane iron to frog. C. Relationship of lever cap to the plane iron cap.	Demonstration Explanation 1, pp. 24-25
V. Adjusting the plane A. Parallel the blade to the bed. B. Regulate depth by turning adjustment nut to your left to raise the blade.	Demonstration 1, pp. 25 2, pp. 94
VI. How to use the plane	Demonstration 1, pp. 28
VII. Proper care of the plane	Demonstration

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 7 of text, pp. 26-30

INSTRUCTOR'S GUIDE SHEETS

No. 11

Job or subject: Sawing Across or With the Grain of the Wood

Objectives: To acquire some knowledge of the hand saws and to develop some skill in using the crosscut and rip saw.

I. **Introduction or preparation:** Throughout this course it will be necessary for each student to know what type saw to use when doing a particular job, therefore, it becomes necessary for each student to realize that each saw is made for one particular purpose.

II. **Presentation:**

Teaching Outline	Teaching techniques, Aids and Devices
I. History of the saw	Explanation 2, pp. 77
II. Types of saws	Illustration
A. Crosscut	1, pp. 18
B. Rip	
C. Back saw	
III. Coarseness or fineness	Explanation
A. Set	1, pp. 18-19
B. Points per inch	2, pp. 79
IV. Difference in crosscut and rip	Illustration 1, p. 19
V. Proper use of the crosscut and rip saw	Demonstration
A. Starting the saw to cut	2, pp. 80
B. Using the thumb for a guide, safety	1, pp. 20
C. Relationship of saw to material	1, pp. 20-22
1. Crosscut 45 degrees	
2. Rip 60 degrees	
3. Back saw parallel to surface	
VI. Holding stock securely	Demonstration
A. Vise	
B. Bench hook	
VII. Safety	Discussion

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 6 of text, pp. 12-18

INSTRUCTOR'S GUIDE SHEETS

No. 12

Job or subject: Measuring and Laying Out

Objectives: To acquire some skill in using the lay out tools.

I. **Introduction or preparation:** Accurate measuring is one of the basic skills to be mastered in working with wood. The foot and inch is the standard line of measurement used in shops and industry.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. History of first measuring devices	Explanation
II. Use of the common tools for measuring and laying out and how they are graduated	Explanation Demonstration 1, pp. 14-17
A. 1 or 2 foot bench rule	
B. Steel square	
C. Try square	
D. Folding rule	
E. Flexible steel tape	
F. T bevel	
G. Marking guage	
III. How to divide widths into equal parts with a rule	Demonstration 1, pp. 15

Reference:

Assignment: Unit 9 of text, pp. 42-45

INSTRUCTOR'S GUIDE SHEETS

No. 13

Job or subject: Squaring Lumber

Objectives: To understand the proper procedure to follow in squaring a board to size.

I. **Introduction or preparation:** Each student must understand this information in order that he can square the material for his project in the least amount of time and with the least amount of difficulty.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. What is meant by squaring a board	Explanation
II. Need for material to be squared	Illustration
III. Steps in squaring a board	Demonstration
A. Square a working face	1, pp. 26-30
B. Square a working edge	
C. Square a working end	
D. Square an opposite face	
E. Square an opposite edge	
F. Square an opposite end	
IV. How to mark the surfaces	Demonstration 2, pp. 107
V. Squaring end grain by planing	Demonstration 1, pp. 28-29
A. Chamfering	
B. Planing from both directions	
VI. How to check for squareness	Demonstration 1, pp. 29

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 13 of text, pp. 42-45

INSTRUCTOR'S GUIDE SHEETS

No. 14

Job or subject: Cutting and Trimming with a Chisel

Objectives: To acquaint the student with the chisel and its uses and to acquire some skill in using the chisel.

I. **Introduction or preparation:** The chisel may prove to be your best friend when cutting accurate fits, shaping, and surface decorating.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Types of chisels	Illustration
A. Tang firmer	2, pp. 116-117
B. Socket framing	
II. Description of chisels	Illustration
A. Cutting edge	1, pp. 42
B. Head	
C. Handle	
III. Use of the chisel	Demonstration
A. Cutting joints whenever it is impossible to do so with other tools.	1, pp. 43-45
B. Cutting chamfers	
C. Cutting groves	
D. Trimming	
E. Rounding corners	
IV. Care of chisels	Demonstration
A. Sharpen when dull	2, pp. 118
B. Use only for their intended purpose	
V. Safety	Discussion
	2, pp. 118

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 27 of text, pp. 109-118

INSTRUCTOR'S GUIDE SHEETS

No. 15

Job or subject: Sharpening Tools

Objectives: To develop an understanding of the necessity of keeping the tools sharp and to acquire some skill in sharpening the tools.

I. **Introduction or preparation:** The degree of workmanship depends upon the sharpness of the tools. No one should undertake any type of a job unless his tools are in good condition.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Sharpening the plane iron	Demonstration
A. Grind at 25 to 30 degrees	1, pp. 111
B. Caution about burning edge	2, pp. 93
C. Round corners	
D. Whet at same angle as ground	
E. Remove the burr	
II. Sharpening the chisel	Demonstration
A. Grind at 25 to 30 degrees	2, pp. 118
B. Caution about burning edge	
C. Whet at same as ground	
III. Sharpening hand scraper blades	Demonstration
A. Draw-file at 90 degrees with mill file.	1, pp. 113
B. Whet the edges	
C. Turn edge with burnisher at 15 degrees then to 8 degrees	
IV. Sharpening cabinet scrapers	Demonstration
A. Draw-file at 30 degrees	2, pp. 114
B. Whet at 30 degrees	
C. Turn edge with burnisher at 15 degrees.	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 10 of text, pp. 31-32

INSTRUCTOR'S GUIDE SHEETS

No. 16

Job or subject: Shaping a Chamfer and a Bevel

Objectives: To acquaint the student with the difference between a chamfer and a bevel and to develop the students skill in cutting the chamfer and the bevel.

I. **Introduction or preparation:** Sometimes it may be necessary to bevel two boards in order to make them fit properly, or you may want to chamfer the edges for decorating purposes.

II. **Presentation:**

Teaching Outline	Teaching techniques, Aids and Devices
I. Difference between chamfer and bevel	Illustration 1, pp. 31
II. Laying out chamfers and bevels A. Use guage or pencil for chamfer B. Use T bevel in laying out bevel	Demonstration 1, pp. 31
III. Planing chamfers A. Fasten stock in vise at 45 degrees B. Use shearing cut C. Plane to both lines on last stroke D. Check with try square	Demonstration 2, pp. 233
IV. Planing bevels A. Fasten stock in vise length ways B. Plane with the grain C. Make stroke full length D. Plane to makr and edge on last stroke E. Check with straight edge and T bevel	Demonstration 1, pp. 31

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 11 and 14 of text, pp. 32-33 and 45-46

INSTRUCTOR'S GUIDE SHEETS

No. 17

Job or subject: Assembling and Adjusting the Spokeshave and Cabinet Scraper

Objectives: To acquire some knowledge of how these tools are used and develop some skill in using them.

I. **Introduction or preparation:** The shaping of irregular pieces may be done with the spokeshave. Although the spokeshave and cabinet scraper look much alike they are not to be confused in their use. The cabinet scraper is used to remove all mill and scratches from the surface before finishing.

II. **Presentation:**

Teaching Outline	Teaching techniques, Aids and Devices
I. Use of the spokeshave	Explanation
A. Early use, making spokes for wheels	1, pp. 32
B. Today's use, making concave and convex surfaces	
II. Using the spokeshave	Demonstration
A. Cuts like a plane	2, pp. 102
B. Push or pull	
III. Adjust depth by raising or lowering the two adjusting nuts	Demonstration 1, pp. 33
IV. Use of the cabinet scraper	Demonstration
A. To remove mill marks	Demonstration
B. To smooth irregular grain	1, pp. 45
V. Using the cabinet scraper	Demonstration
A. Should produce a shaving	2, pp. 114
B. Turn at a slight angle	
C. Hold bed down on stock and push	
VI. Adjust by turning thumb nut until scraper begins to cut	Demonstration 1, pp. 46

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 12 of text, pp. 33-42

INSTRUCTOR'S GUIDE SHEETS

No. 18

Job or subject: Laying Out and Forming Irregular Pieces

Objectives: To acquire knowledge and skill in laying out irregular shapes.

I. **Introduction or preparation:** Sometimes it will be necessary to lay out irregular shapes in making a project. Knowledge of the tools and processes will be advantageous in laying out the shapes in the most efficient manner.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Use of tools and materials	Explanation
A. Dividers	Demonstration
B. Trammel points	1, pp. 33-34
C. Rule	
D. Graph paper	
II. Laying out of irregular shapes	Demonstration
A. Curves, arcs, and circles	Illustration
B. Hexagon	1, pp. 36-38
C. Octagon	
D. Ellipse	
E. Enlarging and transferring	
III. Forming irregular pieces with tools	Demonstration
A. Coping saw	1, pp. 38-40
B. Keyhole saw	2, pp. 83-85
C. Drawknife	
D. Spokeshave	
E. Rasp	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 19 of text, pp. 61-72

INSTRUCTOR'S GUIDE SHEETS

No. 19

Job or subject: Joining

Objectives: To acquaint the student with the different type of joints used in woodworking.

I. **Introduction or preparation:** Many times in furniture construction it becomes necessary to use different type joints in joining two or more pieces of wood together. Todays' lesson will deal with some of the common type joints.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Advantages of joints	Explanation 2, pp. 201
II. Types of joints and procedure for cutting	Demonstration
A. Butt	1, pp. 63
B. Rabbet, end and edge	1, pp. 66
C. Dado, half-blind	1, pp. 66-67
D. Dowel	1, pp. 63-65
E. Mortise and tenon	2, pp. 215-227
F. Miter, spline, and clampnail	2, pp. 205
III. Procedure for making edge glue joints	Demonstration
A. Both ends must touch	1, pp. 64
B. Grain must run the same direction	
C. Alternate annular rings	
D. Assemble	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 16 of text, pp. 48-54

INSTRUCTOR'S GUIDE SHEETS

No. 20

Job or subject: Boring and Drilling Holes

Objectives: To develop an understanding of the tools used in boring and drilling holes and acquire some skill in the use of the tools.

I. **Introduction or preparation:** It will be necessary to drill holes for fastening with screws, dowels, bolts, for boring holes for inside sawing, and surface decoration. Therefore, it is important to understand the information about the tools and equipment to be used.

II. **Presentation:**

Teaching Outline	Teaching techniques, Aids and Devices
I. Tools and their uses	Explanation
A. Brace	Demonstration
B. Hand drill	1, pp. 48
C. Automatic drill	1, pp. 49
II. Types of bits, their use, and how they are numbered	Illustration
A. Auger	1, pp. 49
B. Twist drill	2, pp. 128
C. Gimlet bit	1, pp. 49
D. Expansive bit	1, pp. 49
E. Forstner	2, pp. 129-130
III. Guages for boring holes	Demonstration
A. Adjustable metal depth guage	1, pp. 50
B. Wooden depth guage	
IV. Boring and drilling correctly	Demonstration
A. Starting the hole	1, pp. 50
B. Boring the hole straight	1, pp. 51-52
C. Preventing split outs	1, pp. 52
1. Bore half way through and reverse	2, pp. 134
2. Clamp board on back	
D. Boring with the expansive bit	2, pp. 134

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 17 of text, pp. 54-58

INSTRUCTOR'S GUIDE SHEETS

No. 21

Job or subject: Driving and Pulling Nails

Objectives: To develop an understanding of driving and pulling nails and to acquire some skill in using the tools.

I. **Introduction or preparation:** There is more skill involved in driving and pulling nails correctly than one realizes. Almost everyone has an occasion to drive or pull a nail; therefore, it is essential to know how to use the hammer and how to select the correct nail for the particular job.

II. **Presentation:**

Teaching Outline	Teaching techniques, Aids and Devices
I. Types of commonly used nails	Illustration
A. Box	Examples
B. Common	1, pp. 58
C. Finishing	2, pp. 267
D. Brads	
II. How nails are sized	Explanation
A. Penney	Examples
B. Wire size	2, pp. 272
III. Rules for nailing	Explanation
A. Length of nail should be three times thickness of the board it goes through	1, pp. 59
B. Size of the nail should not be large enough to split the wood	
C. Drill a small pilot hole in hardwood	
IV. Driving and pulling nails	Demonstration
A. Strike even blows, swing forearm with elbow as center of arc	2, pp. 268
B. Slant nails for more holding power	
C. When pulling long nails use a block of wood to increase the leverage	
V. Clinching nails	Demonstration
A. Make 180 degree bend in nail	1, pp. 60
B. Place head on hard surface and drive down	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 23 of text, pp. 85-88

INSTRUCTOR'S GUIDE SHEETS

No. 22

Job or subject: Fastening Hinges and Other Cabinet Hardware

Objectives: To gain an understanding of the use of the different types of hinges and hardware and how they are installed.

I. **Introduction or preparation:** Most furniture requires some type of a hinge or drawer pull. This lesson presents the different types of hinges and hardware and their applications.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Types of hinges and applications	Illustration Example Explanation 1, pp. 85-86
A. Butt hinge	
1. Loose pin	
2. Stationary pin	
B. Surface hinge	
C. Chest hinge	
D. Cabinet hinge	
E. Chest hinge and lid support	
II. Installation of a butt hinge	Demonstration 1, pp. 87 2, pp. 277
A. Select proper size hinge	
B. Determine clearance and wedge	
C. Mark extremities of hinge	
D. Mark width and depth with guage	
E. Cut along line with chisel	
F. Make a series of chisel cuts	1, pp. 87
G. Place hinge in proper setting and mark screw holes	
H. Drill anchor holes	
III. Drawer pulls and knobs	Examples 1, pp. 86
A. Materials	
1. Wood	
2. Plastic	
3. Metal	
B. Single post and double post	Illustration Demonstration
C. Installing pulls	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 22 of text, pp. 81-85

INSTRUCTOR'S GUIDE SHEETS

No. 23

Job or subject: Gluing and Clamping

Objectives: To introduce the students to the different types of glue, their composition, and how to glue their stock together.

I. **Introduction or preparation:** Many times in woodworking it is necessary to glue several boards together edge to edge or face to face in order to make a larger surface or to increase the thickness.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. What is a glue	Explanation
II. Advantages of gluing	Explanation 1, pp. 81
III. Types of glue and their use	Explanation
A. Animal	Illustration
B. Synthetic	1, pp. 81
C. Vegetable	
IV. Preparation of glue in the shop	Explanation
A. Soak over night	Demonstration
B. Heat in double boiler at low temperature	2, pp. 253-254
1. Reheating at high temperature lowers the strength	
2. Reheating at 160 degrees will not affect strength greatly	
C. Glue must be hot and the thickness of cream	
D. Lumber must be warm	
V. Types of clamps and their use	Explanation
A. Bar clamp	Demonstration
B. Hand-screw	1, pp. 82
C. C-clamp	
VI. Procedure for gluing up material	Explanation
A. Edge gluing	1, pp. 83-84
B. Surface gluing	Demonstration

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 24 of text, pp. 88-90

INSTRUCTOR'S GUIDE SHEETS

No. 24

Job or subject: Preparing for Finishing

Objectives: To acquire the necessary knowledge for finishing wood.

I. **Introduction or preparation:** Before applying the finish to the project it is necessary to remove all dents and sand the surfaces in order to remove all scratches. Marks on the project will stand out greatly when the finish is applied.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Types of abrasives and how they are produced A. Flint B. Garnet C. Aluminum oxide D. Emery	Explanation Samples 2, pp. 282-285
II. How abrasive paper is graded	Explanation 1, pp. 89
III. Preparing the surface A. Raise dents B. Use filler on all holes C. Grade of paper to start with and to finish with D. How to sand	Demonstration 2, pp. 287
IV. How to check surface to see if it has been properly sanded A. Hold between yourself and light B. Surface should reflect light	Explanation

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 25 of text, pp. 91-99

INSTRUCTOR'S GUIDE SHEETS

No. 25

Job or subject: Finishing

Objectives: To acquire the basic knowledge needed to finish wood and become more efficient in applying the finishes.

I. **Introduction or preparation:** One of the most important steps in completion of your project is the finishing step. Your project will be no better than the finish.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Materials, supplies, and uses	Explanation
A. Brushes	Demonstration
B. Linseed oil	1, pp. 91
C. Turpentine	
D. Alcohol	
E. Stains	2, pp. 295-301
1. Oil	
2. Water	
3. Spirit	
F. Steel wool	
G. Wax	
II. How to apply stains	Demonstration
A. Oil	1, pp. 92-93
B. Water	
C. Spirit	
III. Mixing and applying filler	Demonstration 2, pp. 303
IV. Applying sealer	Demonstration
V. Applying lacquer	Demonstration
VI. Care of equipment	Demonstration
VII. Rubbing out finish	Demonstration
VIII. Finish room safety	Discussion
A. Use of exhaust fan	
B. Keeping finishing rags in safety can	
C. Keep lids on all finishing supplies	

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 28 of text, pp. 117-124

INSTRUCTOR'S GUIDE SHEETS

No. 26

Job or subject: Sawing on the Circular Saw or Table Saw

Objectives: To acquaint the student with the basic knowledge needed to operate the machine correctly and to develop some skill in using the machine.

I. **Introduction or preparation:** The circular saw will be one of the most used machines in the shop. It is indispensable in any type woodworking shop.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. General information	Explanation
A. Types of saws	Illustration
1. Universal	4, pp. 24
2. Variety	
B. Types of blades and use	4, pp. 29-30
1. Rip	
2. Crosscut	
3. Combination	
4. Dado head	
C. Accessories	Illustration
II. Operations, jigs, and safety precautions	Explanation
A. Ripping	Demonstration
B. Cross cutting	1, pp. 118-120
C. Cutting dados	4, pp. 58-62
D. Cutting rabbets	1, pp. 120-121
E. Cutting tenons	1, pp. 122-123
F. Resawing	4, pp. 47
G. Using stop blocks	4, pp. 56-57
III. Safety rules	Discussion
	1, pp. 118

Reference: Hjorth, Herman, Machine Woodworking

Assignment: Unit 31 of text, pp. 128-129

INSTRUCTOR'S GUIDE SHEETS

No. 27

Job or subject: Planing on the Jointer

Objectives: To acquaint the student with the operations which can be performed on the jointer and help develop the students skill in using the machine.

I. **Introduction or preparation:** The jointer is another indispensable machine in the woodworking shop. The jointer will be especially helpful in making glue joints and working down rough stock.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Use of the jointer	Explanation
II. Parts of the jointer and adjustments	Demonstration
A. Cutterhead and knives	1, pp. 128
B. Guard	
C. Fence	
D. Infeed table	
E. Outfeed table	
III. Operations, safety precautions and devices	Demonstration Explanation
A. Jointing	1, pp. 129
1. Surface	1, pp. 129
2. Edge	1, pp. 129
3. End	4, pp. 132
B. Beveling	1, pp. 129
C. Chamfering	4, pp. 136-137
D. Rabbeting	4, pp. 134-136
E. Tapering	4, pp. 133-134
IV. Safety rules	Discussion 1, pp. 128

Reference: Hjorth, Herman, Machine Woodworking

Assignment: Lecture and Demonstration on Surfacers, Hjorth, Herman, Machine Woodworking, pp. 137-148.

INSTRUCTOR'S GUIDE SHEETS

No. 28

Job or subject: Surfacing Stock on the Surfacer

Objectives: To present the necessary information to the student so that he will be able to use the surfacer correctly.

I. **Introduction or preparation:** In order to plane the rough stock to thickness you must use the surfacer. This lesson will present the procedure for surfacing rough stock and how to use the surfacer safely.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. The purpose of the surfacer	Explanation 4, pp. 137-138
II. Procedure for surfacing to thickness A. Plane one side on the jointer B. Set surfacer one sixteenth inch less than thickest part C. Determine the direction of the grain D. Start board into surfacer E. Cautions 1. Stock should be as long as the distance between rolls 2. Do not take deep cuts	Demonstration 4, pp. 147-148
III. Working parts of surfacer and function A. Cutterhead and knives B. Feed roll C. Delivery rolls	Illustration Explanation 4, pp. 146

Reference: Hjorth, Herman, Machine Woodworking

Assignment: Units 29 and 30 of text, pp. 124-127

INSTRUCTOR'S GUIDE SHEETS

No. 29

Job or subject: Sawing on the Band Saw and the Jig Saw

Objectives: To acquaint the students with the operations which can be performed on the band saw and the jig saw and to develop some skill in using the machines.

I. **Introduction or preparation:** At one time or another you will have to call to use the band saw or the jig saw in cutting irregular shapes which are impossible to cut on other machines.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Parts of the band saw	Explanation
A. Table	1, pp. 125
B. Two adjustable saw guides	
C. Two wheels	
II. Adjustment of band saw	Demonstration
A. Adjustment of blade and tension	4, pp. 88-90
B. Adjustment of saw guides	4, pp. 84
III. Operations performed on the band saw	Demonstration
A. Sawing simple curved outlines	4, pp. 90
B. Inside cutting	4, pp. 92
C. Cutting cabriole legs	4, pp. 93-95
D. Sawing at an angle	4, pp. 101
E. Cutting circular disks	4, pp. 96
F. Resawing	4, pp. 100
IV. Safety rules	Discussion
	1, pp. 124-125
V. Parts of the jig saw	Demonstration
A. Table	1, pp. 126
B. Guide	
C. Upper chuck	
D. Tension sleeve	
VI. Adjustment of tension sleeve and guides	Demonstration
	1, pp. 127

Reference: Hjorth, Herman, Machine Woodworking

Assignment: Unit 32 of text, pp. 130-132

INSTRUCTOR'S GUIDE SHEETS

No. 30

Job or subject: Boring and Drilling Holes with the Drill Press

Objectives: To acquaint the students with the operations which can be performed on the drill press and help develop the students skill in using the machine.

I. **Introduction or preparation:** You will find that the drill press will be of great help when drilling and boring holes or drilling a series of holes.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Parts of the drill press	Explanation
A. Table and table lock	Demonstration
B. Column	1, pp. 132
C. Feed lock	
D. Chuck	
E. Depth guage	
F. Belts for changing speeds	
II. Adjustment of drill press	Demonstration
III. Changing speeds S x D = s x d	Explanation
	2, pp. 193
IV. Operations performed on the drill press	Demonstration
A. Drilling	1, pp. 130
B. Boring	
C. Mortising	1, pp. 131
D. Routing	
V. Safety rules	Discussion
	1, pp. 130

Reference: Hunt and Tate, Hand Woodworking

Assignment: Unit 33 of text, pp. 132-133

INSTRUCTOR'S GUIDE SHEETS

No. 31

Job or subject: Shaping on the Shaper

Objectives: To acquaint the students with the operations performed on the shaper and to develop some skill in the use of the machine.

I. Introduction or preparation: Often we like to decorate or round the edges of our furniture. You will find that the shaper will perform these operations and many more.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Parts of the shaper	Explanation
A. Cutterhead	Demonstration
B. Table	1, pp. 132
C. Guard	
D. Fence	
II. Setting up the cutterhead properly	Demonstration
	4, pp. 168
III. Operations performed on the shaper	Demonstration
A. Rabbets, and tongue and grooves	4, pp. 197-170
B. Straight edge molding	4, pp. 170-172
C. Making rule joints	4, pp. 172-174
D. Shaping curved edges	4, pp. 174-175
1. Use of collar	
2. Use of pen	
IV. Safety rules	Discussion
	1, pp. 132-133

Reference: Hjorth, Herman, Machine Woodworking

Assignment: Unit 34 of text, pp. 134-142

INSTRUCTOR'S GUIDE SHEETS

No. 32

Job or subject: Turning on the Wood Lathe

Objectives: To acquaint the student with the operations of the lathe and to help develop the students skill in operating the wood lathe.

I. **Introduction or preparation:** Since the lathe is principally a hand tool, it requires more skill to operate than one realizes. This lesson will present the procedure for spindle turning and face plate turning.

II. Presentation:

Teaching Outline	Teaching techniques, Aids and Devices
I. Early types of lathes	Explanation 2, pp. 158-160
II. Parts of the lathe and their function	Demonstration
A. Headstock	1, pp. 134
B. Tailstock	
C. Bed	
D. Tool rest	
III. Tools and equipment for lathe work	Explanation
A. Gouge	1, pp. 134-135
B. Skew	
C. Parting tool	
D. Round nose	
E. Diamond point	
F. Calipers, inside and outside	
IV. Spindle turning	Demonstration
A. Preparing the stock	2, pp. 165
B. Turning between centers	2, pp. 169
1. Cutting to rough diameter	2, pp. 169
2. Cutting to finish diameter	2, pp. 171
3. Squaring the ends	2, pp. 172
4. Cutting shoulders	2, pp. 173
5. Cutting tapers	2, pp. 174
6. Turning beads	2, pp. 176
7. Turning vees	2, pp. 178
V. Face plate turning and preparation	1, pp. 139-141

Reference: Hunt and Tate, Hand Woodworking

Assignment:

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The study of the history of industrial arts reveals how the program had its beginning, how it grew and developed, the leaders who contributed to its development, the objectives on which the program has been established, and how the program has been accepted as a part of the general education curriculum.

Summary. The purpose of this study was to develop an adequate course of study suitable for a beginning tenth grade woodworking class. This study is for one semester of hand woodworking followed by one semester of elementary machine woodworking.

The instructor's guide sheets were used as an aid in organizing this course of study. These guide sheets are for the use of the class room teacher and list the lessons which will be presented, state the objectives of each lesson, and outline the subject material into step by step form for presentation of the lesson with the method of presentation, and references which will be of aid to the teacher in presenting the material to the students. At the end of each presentation the next assignments are listed.

Recommendations. It is recommended by this writer that this course of study be put into use and that it should not be considered as complete, but should be improved upon at all times to meet the needs of the students

and to fulfill the objectives of the course. Furthermore, it is recommended that specific instructional visual aids be developed for each lesson and that whenever possible scientific principles should be correlated with the subject material. Also, it is recommended that this type of course construction be used by all industrial arts teachers, especially the beginning industrial arts teacher, in organizing their course material into an orderly step by step presentation.

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VITA

Ronald R. Vandever

Candidate for the Degree of

Master of Science

Report: A PROPOSED COURSE OF STUDY FOR A BEGINNING TENTH GRADE WOODWORKING CLASS

Major Field: Industrial Arts Education

Biographical:

Personal data: Born in Cushing, Oklahoma, July 5, 1937, the son of Marvin and Lorine Vandever.

Education: Attended elementary and secondary school in Cushing, Oklahoma; graduated from Cushing High School in May, 1955; attended Central State College at Edmond, Oklahoma from 1955 to 1957; received the Bachelor of Science Degree from Oklahoma State University in January, 1960; and completed requirements for the Master of Science degree at Oklahoma State University in January of 1961.

Organizations: Member of Phi Delta Kappa, Iota Lambda Sigma, American Industrial Arts Association, Oklahoma Industrial Arts Association, Student Industrial Arts Association.

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AUTHOR: Ronald R. Vandever

REPORT ADVISER: C. L. Hill

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TYPIST: Mrs. Marjorie H. Donoho