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The Identification and Validation of the Minimum Competencies for Woodworking I and Woodworking II Curriculums in Virginia

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THE IDENTIFICATION AND VALIDATION THE MINIMUM COMPETENCIES FOR WOODWORKING I AND WOODWORKING II CURRICULUMS IN VIRGINIA

A STUDY

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by

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Approved, August 1979.

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CHAPTER ONE

INTRODUCTION

The Virginia General Assembly has approved legislation that requires the local school divisions to establish minimum competencies for all their students. In conjunction with this legislation, the department of education has encouraged the implementation of competency based instruction as a means to improve education. Vocational Education in Virginia has established a commitment to full implementation of competency based instruction by June 30, 1982. Since Industrial Arts is a part of Vocational Education it has a commitment to make its programs competency based also.

The Industrial Arts Curriculum K-12 Model Plan was introduced in 1977. This plan outlined the preferred courses, course sequences, and purposes which should be addressed in all industrial arts programs. The plan included the general goals, but did not establish the competencies which the learners should possess when they complete the courses of instruction.

STATEMENT OF THE PROBLEM

Since the Virginia General Assembly requires the establishment of minimum competencies for all students, and the Virginia Department of Education has encouraged the implementation of competency based instruction, identification and validation of competency tasks has become necessary. The problem of this

study was to identify and validate competencies for the area of Woodworking I and Woodworking II in Industrial Arts Education for the state of Virginia.

RESEARCH OBJECTIVES

In order to accomplish the identification and validation of competencies, the following objectives were followed as guides. The researcher would:

1. Validate a prepared list of identified woodworking competency tasks by means of a survey submitted to the advisory committee.
2. Develop those competency tasks selected by the advisory committee into competency based instructional units.
3. Validate the prepared list of developed competency based instructional units by means of a survey submitted to the advisory committee.
4. Prepare and submit to the research director a list of the validated competency based instructionl units.

BACKGROUND AND SIGNIFICANCE

The two world wars this country was involved in caused requirements for increased production as well as for the preparation of people to perform complex skills. Training psychologists perfected educational systems to produce both the

trained personnel and the needed production increase. It seemed reasonable to expect that if the need for personnel with complex skills could be met for the urgent war-time situation that peace-time needs could also be met. The public call for relevance and accountability in education declares the peace-time needs that are to be met.

Competency Based Instruction is a process that seems to meet the current needs. It is a process of stating specifically what makes a person competent in a particular undertaking, and then outlines the teaching of those competencies. In this way a student does successfully complete a Competency Based Instruction course before exiting that course. Curriculum consistancy within the state is needed to meet the accountability needs. Currently not all school districts are working on the same curriculum in industrial arts. A state-wide curriculum of Competency Based Instruction would alleviate this disparity.

LIMITATIONS

The limitations of the study were -

1. that the study pertained to the development of Competency Based Instruction curriculum elements for the Virginia Industrial Arts Program,

2. that analysis of the findings was based on only the responses of those professionals on the advisory committee which was limited to nine members,
3. That this study was limited to personal enrichment coursed including only Woodworking I and Woodworking II Competency Based Instruction in Virginia,
4. that this study was intended to describe only the minimum competency tasks considered by the advisory committee to be needed for Competency Based Instruction in Virginia,
5. that the development of tasks into Competency Based Instructional Units was restricted to the format specified by the state.

PROCEDURES

The procedures that were followed in this study consisted of the following:

1. reviewing the existing woodworking texts and interviewing several teachers and teacher educators in the area of woodworking,
2. identifying the competency tasks,

3. submitting the selected tasks to the advisory committee for approval,
4. meeting with the committee to discuss and vote on additions and deletions of competency tasks,
5. developing those selected competency tasks into Competency Based Instructional Units in the prescribed format,
6. submitting the developed Competency Based Instructional Units to the advisory committee for approval and comments or suggestions for improvement,
7. meeting with the advisory committee to discuss and vote on any corrections to the Competency Based Instructional Units,
8. Making the advised corrections,
9. submitting the completed list approved by the advisory committee to the research program director
10. reviewing the related literature that pertained to Competency Based Education and Competency Based Instruction.

DEFINITION OF TERMS

For the purpose of making the terms used in this study clear and easily understood, the following list of definitions is offered.

1. Competency Based Instructional Unit is that competency task developed in the format specified by the state as follows:

   AREA OF COMPETENCE:
   CONTENT/CONCEPT:
   TASK:
   CRITERION REFERENCED MEASURE:
   PERFORMANCE GUIDES:

2. Competency Based Instruction is a system designed to develop prespecified knowledge, skills, and attitudes in learners who are enrolled in an educational program; is a means of education based upon the identification and attainment of prespecified outcomes (Joyner and Ritz, 1978, p. iii).
3. Area of Competence identifies the industrial arts course for which the particular task was prepared (Joyner et al., 1978, p. iii).
4. Content/Concept identifies the sub-area for which the particular task was prepared (Joyner et al., 1978, p. iii).

5. Task identifies the knowledge, attitude, or skill that the learner can and should acquire (Joyner et al., 1978, p. iii).
6. Criterion Referenced Measure is the means to identify whether or not the learner can successfully perform the stated task (Joyner et al., 1978, p. iii).
7. Performance Guides are sub-tasks and study hints which are intended to assist the learner in learning and performing the criterion referenced measure (Joyner et al., 1978, p. iii).

SUMMARY

Chapter one has described the purpose for the study, the procedures followed, and a definition of terms. The research objectives and limitations of the study were listed. The rationale for the study was also discussed. The following chapters cover the review of literature, methods and procedures, and a record of findings of the study followed by a summary of the study with conclusions and recommendations. The methods and procedures include a description of the population, a description of the type of instrument used for surveying, data collection methods, and the statistical analysis used in the study.

CHAPTER TWO

REVIEW OF LITERATURE

INTRODUCTION

In 1977 the Virginia K-12 Industrial Arts Curriculum was introduced. Outlined in this plan were the preferred courses, course sequences, and purposes intended to be addressed in the state's industrial arts programs. The exact knowledge, skills, and attitudes desired were not included in that model curriculum plan. Within the plan the prescribed courses included the personal enrichment courses of power mechanics, woodworking, metalworking, industrial crafts, general industrial arts, graphic arts, electricity/electronics, and mechanical drawing, as well as the pretechnical courses of communications technology, power and transportation technology, and materials and processes technology for High School level work. For the Middle or Junior High School the orientation and exploration courses of manufacturing, construction, modern industry and technology, and exploring technology were prescribed. The Elementary School was limited to the learning reinforcement industrial arts activities integrated within the elemantary curriculum. Only the woodworking portion of that curriculum was delt with in this study. Tables I and II contain the state prescribed course outlines for Woodworking I and II respectively. Following these is a description of Competency Based Instruction.

I. Technology of Woods
   - A. Hardwoods
   - B. Softwoods
   - C. Manufactured woods

II. Design Principles, Reading Drawings and Planning

III. Basic Hand-Tool Processes
   - A. Planing
   - B. Circular sawing
   - C. Power hand sawing
   - D. Scroll sawing
   - E. Jointing
   - F. Boring
   - G. Shaping
   - H. Mortising
   - I. Routing
   - J. Turning

VI. Wood Product Construction
   - A. Joinery
   - B. Bending and laminating
   - C. Veneering and inlaying
   - D. Plastic laminates
   - E. Frame and panel construction
   - F. Cabinet and doors
   - G. Drawers and drawer guides
   - H. Legs and posts
   - I. Leg and rail construction

VII. Finishing

VIII. Line/Mass Production

IX. The Industrial Arts Student Association: Wood Product Industries

TABLE I

I. Principles of Furniture Design and Development

II. Materials of Furniture Industry
- A. Cabinet Woods
- B. Manufactured woods
- C. Millwork and moldings
- D. Hardware
- E. Fasteners
- F. Adhesives

III. Machine Tool Processes
- A. Planing
- B. Circular sawing
- C. Power hand sawing
- D. Scroll sawing
- E. Jointing
- F. Boring
- G. Shaping
- H. Mortising
- I. Routing
- J. Turning

IV. Machine Tool Maintenance

V. Cabinet Construction
- A. Joinery
- B. Frame and panel
- C. Leg and rail
- D. Cabinet and furniture dooes
- E. Drawer and drawer guides
- F. Cabinet interiors
- G. Legs and post
- H. Table and cabinet tops

TABLE II

VI. Upholstering

VII. Finishing

VIII. The industrial Arts Student Association: Furniture Design studio and Crafts Guilds.

TABLE II CONTINUED

REVIEW OF LITERATURE

"In many ways, competency based education reflects the basic tenets of American society with respect to its pragmatic concern for doing, not just knowing how to do, and with continuing to do that which appears to be effective in achieving objectives. Ultimately, competence is judged on the basis of results....." (Houston and Warner 1977, p. 14). The concept of competency based instruction began in the 1960's. "The ten elementary models for teacher preparation supported by the Bureau of Research, USOE, in 1968-69 are typically credited as the epoch for competency based education" (Houston et al., 1977, p. 14). "Both human nature and the preponderance of research indicate that persons are generally more likely to achieve clearly delineated goals and objectives than fuzzy or unknown ones" (Houston et al., 1977, p. 15). However, all persons are not completely positively disposed towards competency based education/instruction.

Several people have pointed out what they think of as negative aspects of the competency movement.

> Haynes and Coyne (1971) were concerned that competencies would perpetuate the status quo in schools. Since teachers would be judged on current standards of performance in classrooms, they might forsake more innovative and newer approaches. Hogan (1973) was concerned

> that instructional skills could be conceptualized as isolated from content.....Some critics have been concerned about integrating teaching competencies into what Bruce Joyce has referred to as a 'seamless web of teaching.'.....Assessment of competence has repeatedly been noted as a major weakness of CBE.....Elam (1972) stated that: 'The overriding problem before which the others pale into insignificance is that of the adequacy of measurement instruments and procedures' (p. 3) (Houston et al., 1977, p. 16).

So there are adversaries of competency-based education or competency-based instruction as the basis for a curriculum. Although, as stated previously, the majority seem to be in favor of competency-based education.

Competency based instruction has a number of characteristics that make it a promising alternative instructional mode. Schmieder (1973) listed these characteristics as being "specific and general" (p. 5). These characteristics appear in Table III. The characteristics outline all of the positive aspects of competency based instruction. Competency based instruction can be defined as "a system designed to develop pre-specified role relevant competencies in those who are products of the system" (Wright 1972, P. 37) Thus, a student masters all tasks at the stated levels prior to exiting the course. When a learner is in the position of

CHARACTERISTICS OF COMPETENCY BASED INSTRUCTION

Specific	General
Precise objectives stated in behavioral terms.	Comprehensive
Criteria to be applied in assessing the competencies of students is made explicit and public - and negotiable.	Systematic
Students held responsible for meeting these criteria.	Broad-based decision making
Decision-making regarding training needs based on successful mastery of objectives.	Heavy emphasis on needs assessment
Instructors held accountable for effectiveness of planned program.	Learner focused
Achievement held constant and time varied.	Multiple program options for every set of objectives
Emphasis placed upon exit requirements with considerable flexibility in entrance requirements.	Continual evaluation-feedback adjustment cycle basic part of program
	Personalized/modulerized
	Regenerative
	Field-oriented-performance based
	Assessment-evaluation used as management tools
	Use of educational technology
	Use of open space concept
	Use of instructional teams

TABLE III

striving to master one task at a time from a specific list of tasks to be mastered he knows where he is, where he is going, and how far there is to go. As previously stated a learner will generally perform better under conditions that are clear to him.

When various colleges started analyzing tasks required by teachers in the classroom the investigations "were to determine those skills needed for the teachers so they would perform their tasks well" (Dyer 1974, p. 38). Now many states have a competency based curriculum in some form or other. No longer is the competency based education effort for teacher educators or teachers only. The movement has spread to the point of being implemented in the public schools. Public schools have seen curricular elements similar to competency based instruction before.

Miller (1974), in describing a performance based approach to drafting, stated that:

> One very successful way of packaging the teaching-learning materials through which these instructional strategies may be implemented is with the modular format. The modular approach provides increased possibilities for self-pacing, individualization, personalized instruction, independent study and alternate means of instruction. (p.40).

The model in Miller's article had the title parts listed as directions, introduction, performance objectives, pre-test, learning experiences, post-test, and references.

This modular format closely resembles an individualized learning activity package. Baker (1974), in the same vein, recommends "terminal objectives, enabling objectives, and prerequisites" (p. 54). A format described by Hirst (1977), director of V-TECS, is almost identical to the Virginia format which follows:

Job: ...
Duty: ...
Task: ...
Performance Objectives: ...
(criteria for success):
Performance Guides: (p. 33).

SUMMARY

Competency based instruction for Woodworking I and II fits into the prescribed curriculum for Virginia in the personal enrichment courses. These courses are for the High School level students. Tables I and II list the prescribed course outlines for Woodworking I and II. A preponderance of the research completed reflects a positive attitude towards competency based instruction, although some negative feeling does exist. It was stated that learners generally do better when they know clearly what they are about. Competency based instruction clearly specifies what is to be done. The task remains static; only the completion time varies. Table III lists many characteristics that make

competency based instruction/education a promissing alternative instructional mode. Competency based education started as a mode for training teachers, but it has now spread to include Vocational Education and Industrial Arts Education in the public schools.

CHAPTER THREE

METHODS AND PROCEDURES

INTRODUCTION

The methods and procedures that governed the conduct of this study were set forth in a document entitled Development of a Competency-Based Instruction Curriculum Plan (Ritz and Joyner, 1978). This document identified the population, specified the format, and outlined the procedures of validating the information. The following section provides an indepth discussion of the methods and procedures.

METHODS AND PROCEDURES

The survey population consisted of a selection of nine persons deemed to be knowledgeable in industrial arts woodworking. This included persons who had demonstrated superior knowledge in specific areas such as curriculum development, competency based instruction for teacher education and the subject area. Teacher educators, secondary education industrial arts teachers and city supervisors for industrial arts were among the people selected for population inclusion. These individuals were selected by the co-directors of the state curriculum project, approved by the state supervisor and trained at a conference for the development of industrial

arts criterion referenced competency catalogs held at Norfolk, Virginia. These people were the respondents of the survey instruments as well as members of the reviewing committee.

The objectives of the study were to identify tasks and develop the selected tasks into competency based instruction units in the prescribed format described in chapter one. The procedures established to attain these objectives included the following tasks. The researcher would:

1. review any related literature and report on it,
2. review numerous selected textbooks for task identification,
3. interview several respected teachers of industrial arts for task identification,
4. interview several industrial arts teacher educators for task identification,
5. draw upon the researcher's expertise for task identification,
6. prepare a survey that included the list of identified tasks,
7. transmit the survey to the selected population,
8. receive and tabulate the responses,
9. present the responses at the first review meeting,

10. develop the tasks agreed upon at the first meeting into competency based instruction units,
11. prepare a second survey that includes the developed tasks,
12. transmit the second survey to the selected population,
13. receive and tabulate the responses to the second survey,
14. present the second survey responses at the second meeting for review,
15. prepare a list of the units agreed on at the second meeting for review,
16. transmit the prepared final list to the project co-directors.

The foregoing tasks were carried out on a specified timetable. In addition to these tasks, other methods and procedures included reviewing text books and establishing the criterion used for the rejection of a specific tasks.

The books reviewed were books by Donnelly, Hammond, Harrod and Reyner (1966), Feirer (1965), Feirer (1970), Feirer (1971), Hjorth and Holtrop (1958) and Smith and Maddox (1966). The criterion used for the rejection of a specific task was based on simple majority rule. An example of the type of instrument used for surveying appears in Appendix I and Appendix II.

SUMMARY

The research was conducted in accordance with the prespecified conditions. The literature was reviewed, the tasks were identified and developed, the tasks were validated and the final list of tasks transmitted to the co-directors of the project. The final list appears in Appendix III

CHAPTER FOUR

FINDINGS OF THE STUDY

INTRODUCTION

This chapter contains a brief explaination of what the researcher found during the study. Responses to the surveys are discussed as well as results of some of the actions of the reviewing committee.

FINDINGS

The responses to both survey one and survey two were 100 percent. The attendance at the committee meetings varied. The first meeting was attended by 60 percent of the members and the second was attended by 100 percent of the members. During the meetings several of the tasks proposed by the researcher were rejected by the committee. Many wording changes were made and a few additional performance guides were recommended to the researcher by the committee. Prior to the second committee meeting 18 of the separate tasks were combined into nine tasks. It was felt by the researcher and the committee members that the resulting condensed list of tasks was not only just as comprehensive, but was better ordered and would allow the implementing teacher more latitude. The final list of tasks appears in Appendix III.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

Considerable research has been done on competency based education and performance based education. Most of this research indicates favorable attitudes toward competency based type curriculum, although some people do disagree. Competency based instruction in Woodworking I and II has many advantageous characteristics that should allow it to:

1. be effective in satisfying the accountability being called for by the public,
2. be effective in coordinating the efforts of the several school systems of the state in the area of subject matter being taught,
3. be an effective tool to be used by all teachers in the development of their curriculum and lesson plans,
4. be effective in satisfying the needs and desires of the students.

It offers the students clearly stated tasks to be performed. The student can easily understand what is required of him. Generally students respond to instruction better when they have clearly stated tasks to perform. The tasks developed by this research are intended to be the minimum

competency tasks for High School personal enrichment courses in Woodworking I and II. The format used was prescribed by the state. The basic procedures used were reviewing books, interviewing and surveying reputable teachers and teacher educators, organizing and submitting the material for review committee approval. Examples of the type of instrument used for the surveys appear in Appendixes I and II. Appendix III shows the results of the study. The remainder of this chapter is concerned with conclusions and recommendations.

CONCLUSIONS

Since this study was developmental in nature, rather than pure research, Appendix III represents the sum total of the conclusions. The recommendations are specifically stated in the following paragraph.

RECOMMENDATIONS

The author recommends a follow-up study be made after the implementation and functional use of Competency Based Instruction in Industrial Arts Woodworking I and II classes in Virginia. This study should include a survey of each and every Woodworking I and II teacher in the state. The purpose of the study should be to acquire a completely comprehensive consensus of opinion of the state's teachers.

A second recommendation is that the teacher educating institutions in the state incorporate into their curriculum courses designed to train both existing teachers and undergraduate students in methods of implementing Competency Based Instruction in Industrial Arts. A third recommendation is that all high school teachers of woodworking in Virginia implement the Competency Based Instruction program.

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LIST OF APPENDIXES

APPENDIX I

VALIDATION SURVEY OF WOODWORKING COMPETENCIES I

This study is aimed at validating competencies desired by all students completing identified industrial arts programs in the State of Virginia. Circle the one response which most nearly describes your opinion of each statement. If you feel additional competencies need to be added to the competency list, please note them on the final page of the survey.

An example of how the survey should be completed is provided:

Key: A - Indicates agreement with the stated item.

U - Indicates no opinion or undecided.

D - Indicates disagreement with the stated item.

Example: (A) U D 4. CONTENT/CONCEPT: Safety in Woodworking
TASK: Develop a knowledge of general shop safety in woodworking.

APPENDIX II

VALIDATION SURVEY OF WOODWORKING COMPETENCIES II

This study is aimed at validating competencies desired by all students completing identified industrial arts programs in the State of Virginia. Circle the one response which most nearly describes your opinion of each statement. If you feel additional competencies need to be added to the competency list, please note them on the final page of the survey.

An example of how the survey should be completed is provided:

Key: A - Indicates agreement with the stated item.
U - Indicates undecided or no opinion.
D - Indicates disagreement with the stated item.

Example:

(A) U D 4. AREA OF COMPETENCE: Woodworking
CONTENT/CONCEPT: Scroll Saw
TASK: Develop skill in performing cuts with scroll saw.
CRITERION REFERENCED MEASURE: Make cuts with the scroll saw using prescribed safety procedures.
PERFORMANCE GUIDES:
1. Observe demonstration on scroll saw.
2. Drill a relief hole in the center of some waste stock, insert saw blade .....

APPENDIX III

FINAL LIST OF TASKS

TASK # 1

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Woodworking Occupations

TASK: Acquire an Awareness of Woodworking Occupations.

CRITERION REFERENCED MEASURE: Select a number of woodworking occupations and list the following characteristics - probable duration of the occupation, wage or salary to be expected, physical requirements, and the educational level required for job entry.

PERFORMANCE GUIDES:

1. Check with the state employment agency.
2. Read the text assignment on woodworking.
3. Observe the class presentations.
4. Observe and participate in any possible field trips, such as - construction sites, furniture factories, cabinetmakers, tool and die makers, boat builders, etc....

TASK # 2

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Safety

TASK: Acquire an Awareness of General Lab Safety.

CRITERION REFERENCED MEASURE: List and explain the general lab safety rules.

PERFORMANCE GUIDES:

1. Read the text assignment on safety.
2. Observe class presentations.
3. Participate in class discussions.
4. Make a list of the safety rules.
5. Practice safety rules every time you are in the lab.

TASK # 3

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Wood Science

TASK: Acquire an Awareness of the Nature of Wood.

CRITERION REFERENCED MEASURE: Describe the nature of wood in terms of springwood, summerwood, cells, and fibers.

PERFORMANCE GUIDES:

1. Read the text assignment on the nature of wood.
2. Observe class presentations.
3. Participate in class discussions.
4. Select a piece of wood for demonstrating springwood and summerwood.
5. Make a sketch of cells and fibers.
6. Observe wood samples and describe characteristics.

TASK # 4

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Wood Science

TASK: Differentiate Between Hardwoods and Softwoods.

CRITERION REFERENCED MEASURE: Demonstrate a knowledge of hardwoods and softwoods including listing hardwoods and softwoods, identifying applications, and discussing wood classification processes.

PERFORMANCE GUIDES:

1. Read the text assignment on wood types and identification.
2. Observe class presentations.
3. Participate in class discussions.
4. Make lists of hardwoods and softwoods.
5. Participate in possible field trips to lumber mills and lumber yards.
6. Experiment with samples of hardwoods and softwoods.

TASK # 5

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Wood Science

TASK: Describe Tree Structure.

CRITERION REFERENCED MEASURE: Illustrate and label a tree structure including - heartwood, sapwood, cambium, phloem, and outer bark.

PERFORMANCE GUIDES:

1. Read the text assignment on tree structure.
2. Observe class presentations.
3. Participate in class discussions.
4. Using a sample tree trunk, identify the components of the tree structure.
5. Observe a lecture by forestry service representative.

TASK # 6

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Wood Science

TASK: Acquire a Knowledge of Wood Grain.

CRITERION REFERENCED MEASURE: Describe wood grain including quarter cut lumber, plain cut lumber, open grain, semi-open grain, and closed grain.

PERFORMANCE GUIDES:

1. Read the text assignment on wood grain and types of cuts.
2. Observe class presentations.
3. Participate in class discussions.
4. Participate in possible field trips to a lumber mill.
5. Select wood samples and identify the types of mill cuts and types of grain.
6. Observe a film about wood grain.

TASK # 7

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Lumber

TASK: Describe Lumber Seasoning.

CRITERION REFERENCED MEASURE: Characterize the seasoning of lumber including drying times, drying methods, moisture content, use of steam, air drying, kiln drying, and radio frequency drying.

PERFORMANCE GUIDES:

1. Read the text assignment on seasoning.
2. Observe class presentations.
3. Participate in class discussions.
4. Participate in possible field trips to lumber yards or lumber mills.
5. List seasoning methods.

TASK # 8

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Lumber

TASK: Acquire a Knowledge of Lumber Defects.

CRITERION REFERENCED MEASURE: List and describe lumber defects including checks, pecks, shakes, heart pith, knot decay, stain, pitch pockets, warp, bow, and crook.

PERFORMANCE GUIDES:

1. Read the text assignment on lumber defects.
2. Observe class presentations.
3. Participate in class discussions.
4. List the defects of lumber.
5. Collect samples of lumber defects.
6. Participate in possible field trips to lumber yards.

TASK # 9

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Lumber

TASK: Develop Skill in Computing Board Feet.

CRITERION REFERENCED MEASURE: Describe board foot measure including purpose and computation.

PERFORMANCE GUIDES:

1. Read the text assignment on board foot measure.
2. Observe class presentations.
3. Participate in class discussions.
4. Practice measurement exercises.
5. Participate in possible field trips to lumber yards.
6. Calculate the board feet of lumber needed for projects.

TASK # 10

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Processed Woods

TASK: Describe the Characteristics of Plywood.

CRITERION REFERENCED MEASURE: Characterize plywood including source, structure, and function.

PERFORMANCE GUIDES:

1. Read the text assignment on plywood.
2. Observe class presentations.
3. Participate in class discussions.
4. List advantages and disadvantages of plywood.
5. List types and grades of plywoods.
6. List uses for plywood.
7. Collect samples of plywoods.

TASK # 11

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Processed Woods

TASK: Describe the Characteristics of Veneers.

CRITERION REFERENCED MEASURE: Characterize wood veneer including source, structure, and function.

PERFORMANCE GUIDES:

1. Read the text assignment on veneering.
2. Observe class presentations.
3. Participate in class discussions.
4. Participate in field trip to a veneer mill.
5. List uses for veneers.
6. Collect samples of veneers.

TASK # 12

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Processed Woods

TASK: Describe the Characteristics of Hardboard and Fiberboard.

CRITERION REFERENCED MEASURE: Characterize hardboard and fiberboard in terms of construction, size availability, and uses.

PERFORMANCE GUIDES:

1. Read the text assignment on processed wood.
2. Observe class presentations.
3. Participate in class discussions.
4. Participate in field trip to wood processing plant.
5. List characteristics and some uses of hardboard and fiberboard.

TASK # 13

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Planning

TASK: Develop Skill in Planning.

CRITERION REFERENCED MEASURE: Demonstrate the ability to properly plan a project including sketches, drawings, bills of materials, and lists of needed tools.

PERFORMANCE GUIDES:

1. Read the text assignment on planning.
2. Observe the class presentations.
3. Participate in class discussions.
4. Practice sketches, drawings, material bills, and tool lists for a project (s) you would like to make.

TASK # 14

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Layout Tools

TASK: Develop Skill in Using Layout Tools, Both English and S.I. Metric.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the following layout tools - bench rule, zig zag rule, flexible tape rules, marking gauge, squares, sliding T bevel, dividers or trammel points, level, and plumb bob and line.

PERFORMANCE GUIDES:

1. Read the text assignment on layout.
2. Observe the class presentations.
3. Participate in class discussions.
4. Select a project(s) and lay it out.
5. Select various appropriate articles and demonstrate measuring with different kinds of rules including metric measurements.

TASK # 15

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Basic Machines

TASK: Acquire a Knowledge of Basic Machines.

CRITERION REFERENCED MEASURE: List and give examples of the six basic machines including - the lever, wheel and axle, pulley, inclined plane, wedge, and screw.

PERFORMANCE GUIDES:

1. Read the text assignment on basic machines.
2. Observe class presentations.
3. Participate in class discussions.
4. List and give examples of the six basic machines.

TASK # 16

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Hand Tools

TASK: Develop Skill in the Use of Hand Saws.

CRITERION REFERENCED MEASURE: Demonstrate the correct and safe use of the following hand saws - back saw, cross cut, rip, compass, keyhole, coping, miter box, and dovetail saw.

PERFORMANCE GUIDES:

1. Read the text assignment on hand saws.
2. Observe the class presentations.
3. Participate in class exercises in sawing.
4. Demonstrate good sawing practices.
5. Observe a training film on hand saw usage.

TASK # 17

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Hand Tools

TASK: Develop Skill in the Use of Hand Planes.

CRITERION REFERENCED MEASURE: Demonstrate the correct and safe use of the following planes - block plane, jack plane, fore plane, and spoke shave.

PERFORMANCE GUIDES:

1. Read the text assignment on planes.
2. Observe class presentations.
3. Participate in class discussions.
4. Take apart and assemble the jack plane.
5. Practice using planes.
6. Observe a training film on hand plane.

TASK # 18

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Hand Tools

TASK: Develop Skill in the Use of the Chisel, Gouge, and Carving Tools.

CRITERION REFERENCED MEASURE: Demonstrate the correct and safe method to use the chisel, gouge, and carving tools.

PERFORMANCE GUIDES:

1. Read the text assignment on carving tools.
2. Observe class presentations.
3. Participate in class discussions.
4. Practice using the chisel, gouge, and carving tools.

TASK # 19

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Hand Tools

TASK: Develop Skill in the Use of the Miter Box.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the miter box including making square and angled cuts.

PERFORMANCE GUIDES:

1. Read text assignment on miter box.
2. Observe class presentations.
3. Participate in class discussions.
4. Practice using the miter box.

TASK # 20

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Hand Tools

TASK: Develop Skill in Using Surform Tools and Wood Files.

CRITERION REFERENCED MEASURE: Demonstrate skill in using surform tools and wood files.

PERFORMANCE GUIDES:

1. Read the text assignment concerning surform tools and files.
2. Observe the class presentations.
3. Practice using surform tools and wood files.
4. Take part in class discussions.

TASK # 21

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Hand Tools

TASK: Develop Skill in the Use of the Hand Scraper and Cabinet Scraper.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the hand scraper and cabinet scraper.

PERFORMANCE GUIDES:

1. Read the text assignment on the hand scraper and the cabinet scraper.
2. Observe the class presentations.
3. Participate in the class discussions.
4. Practice using the hand scraper and cabinet scraper.

TASK # 22

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Hand Tools

TASK: Develop Skill in the Use of Hand Boring Tools.

CRITERION REFERENCED MEASURE: Demonstrate skill in using hand boring tools including the automatic drill, hand drill, brace, expansion bit, auger bit, dowel bit, forestner bit, and twist drill.

PERFORMANCE GUIDES:

1. Read the text assignment on hand boring tools.
2. Observe the class presentations.
3. Practice using the hand boring tools.
4. Participate in class discussions.
5. Observe a film strip on hand boring.

TASK # 23

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Fasteners

TASK: Develop Skill in Selecting and Using Nails and Screws.

CRITERION REFERENCED MEASURE: Demonstrate skill in selecting and using the correct nails and screws for different jobs.

PERFORMANCE GUIDES:

1. Read the text assignment on nails and screws.
2. Participate in class discussions.
3. Observe class presentations.
4. Practice using screws and nails.
5. Discuss the practice of pre-drilling and countersinking.
6. Observe films on fastening.

TASK # 24

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Fasteners

TASK: Develop Skill in Selecting and Using Fasteners.

CRITERION REFERENCED MEASURE: Demonstrate skill in selecting and using fasteners including molly bolts, miter joint fasteners, toggle bolts, repair plates, T plates, bent corner plates, clat corner plates, and chevrons.

PERFORMANCE GUIDES:

1. Read the text assignment concerning fasteners.
2. Observe class presentations.
3. Participate in class discussions.
4. Practice using fasteners.

TASK # 25

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Fasteners

TASK: Acquire a Knowledge of Adhesives.

CRITERION REFERENCED MEASURE: Demonstrate a knowledge of adhesives including - liquid hide glue, white liquid resin, resorcinol, powdered resin glue, casein, contact cement, and epoxy resins.

PERFORMANCE GUIDES:

1. Read the text assignment on adhesives.
2. Observe class presentations.
3. Practice using some glues to test their characteristics.
4. List the adhesives under titles of water-proof, water-resistant, and low water resistant.

TASK # 26

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Surface Preparation

TASK: Develop Skill in Raising Dents in Wood and Selecting and Using Fillers, Plastic Wood, and Putty.

CRITERION REFERENCED MEASURE: Demonstrate skill in surface preparation including wood fillers, plastic wood putty, wet cloth and hot iron.

PERFORMANCE GUIDES:

1. Read the text assignments concerning surface preparation.
2. Observe class presentations.
3. Participate in class discussions.
4. Practice preparing wood surfaces.

TASK # 27

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Surface Preparation

TASK: Develop Skill in the Selection and Use of Abrasives.

CRITERION REFERENCED MEASURE: Demonstrate skill in the use of abrasives including materials, backing, bond, grit types, and methods of use.

PERFORMANCE GUIDES:

1. Read the text assignment on abrasives.
2. Observe class presentations.
3. Participate in class discussions.
4. List abrasive materials and discuss their characteristics.
5. List backing materials and discuss their characteristics.
6. List bonding materials and discuss their characteristics.
7. Discuss correct sanding procedures including sealing.

TASK # 28

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Finishing

TASK: Develop Skill in Staining Wood.

CRITERION REFERENCED MEASURE: Demonstrate skill in selecting and using stains including oil stain, spirit stain, water stain, and soluble and insoluble pigment.

PERFORMANCE GUIDES:

1. Read the text assignment on staining.
2. Observe class presentations.
3. Participate in class discussions.
4. List types of stains.
5. Describe soluble and insoluble pigment.
6. Practice staining.
7. Collect and label samples of stained wood for reference use.

TASK # 29

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Finishing

TASK: Develop Painting Skills.

CRITERION REFERENCED MEASURE: Demonstrate the use of paint finishes including oil paint, enamels, latex, and acrylic paints.

PERFORMANCE GUIDES:

1. Read the text assignment on finishing.
2. Observe the class demonstrations.
3. Participate in class discussions.
4. Discuss the properties of oil paints, enamels, latex, and acrylic paints.
5. Practice using paints.

TASK # 30

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Finishing

TASK: Develop Skill in Using Transparent Finishes.

CRITERION REFERENCED MEASURE: Demonstrate skill in using transparent finishes including wax, shellac, varnish, lacquer, oils, and polyurethane.

PERFORMANCE GUIDES:

1. Read the text assignment on finishing.
2. Observe class presentations.
3. Participate in class discussions.
4. List the characteristics of the transparent finishes.
5. Practice using transparent finishes.

TASK # 31

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Powered Tools

TASK: Develop Skill in Using the Table (Circular) Saw.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the table (circular) saw including adjustment of the following parts: table, guard, splitter, fence, miter gauge, raising handle, and tilt handle.

PERFORMANCE GUIDES:

1. Read the text assignment on the table saw.
2. Observe class presentations.
3. Study the table saw operating instructions and safety precautions.
4. Practice using the table saw for ripping and cross cutting.
5. Observe a training film on table saw operation.

TASK # 32

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Powered Tools

TASK: Develop Skill in Using the Band Saw.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the band saw for miter, curve, and freehand cuts and include discussions on the following parts - guide wheels, blade guard, blade support wheel bar or post, lower wheel guard, table tilt handle, upper wheel guard, tension control, and table.

PERFORMANCE GUIDES:

1. Read the text assignment on the band saw.
2. Observe class presentations.
3. Study the band saw operating instructions and safety rules.
4. Practice using the band saw.
5. Observe a training film on band saw operations.

TASK # 33

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Powered Tools

TASK: Develop Skill in Using the Scroll/Jig Saw.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the scroll saw including discussing the selection of the correct blade and blade changing.

PERFORMANCE GUIDES:

1. Read the text assignment on the scroll/jig saw.
2. Observe the class presentations.
3. Practice using the saws.
4. List the safety rules for using the saw.
5. Disucss the blades and blade changing.
6. Observe a training film on the scroll/jig saw.

TASK # 34

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Powered Tools

TASK: Develop Skill in Using the Drill Press.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the drill press including discussing the depth stop, quill lock, quill, chuck, feed handle, column table, table locking clamp, and base.

PERFORMANCE GUIDES:

1. Read the text assignment on the drill press.
2. Read the operating instructions on the drill press.
3. Study the safety rules on using the drill press.
4. Observe the class presentations.
5. Practice using the drill press.
6. Observe a training film on drill press usage.

TASK # 35

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Powered Tools

TASK: Develop Skill in Using the Portable Electric Drill.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the portable electric drill.

PERFORMANCE GUIDES:

1. Read the text assignment on the portable drill.
2. Observe the class presentations.
3. List safety rules of the electric drill.
4. Practice using the portable drill.

TASK # 36

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Powered Tools

TASK: Develop Skill in Using the Electric Hand Sanders.

CRITERION REFERENCED MEASURE: Demonstrate skill in using electric hand belt sanders and electric orbital sanders.

PERFORMANCE GUIDES:

1. Read the text assignments on the electric hand sanders.
2. Observe class presentations.
3. List safety rules.
4. Practice using the sanders.

TASK # 37

AREA OF COMPETENCE: Woodworking I

CONTENT/CONCEPT: Power Tools

TASK: Develop Skill in Using the Sabre Saw.

CRITERION REFERENCED MEASURE: Cut a beveled, straight, and curved line using the sabre saw.

PERFORMANCE GUIDES:

1. Read the text assignment on the sabre saw.
2. Observe the class presentations.
3. Take part in class discussions.
4. Practice using the sabre saw.
5. Observe a training film on sabre saw useage.

TASK # 38

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Woodworking Occupations

TASK: Acquire a Knowledge of Commercial Woodworking Occupations.

CRITERION REFERENCED MEASURE: Select a number of woodworking occupations and list the following characteristics - probable duration of the occupation, wage or salary to be expected, physical requirements, and the educational level required for the work.

PERFORMANCE GUIDES:

1. Check with the state employment agency.
2. Read the text assignment on woodworking.
3. Observe the class presentations.
4. Observe and participate in any possible field trips to construction sites, furniture factories, cabinet makers, tool and die makers, boat builders, or other locations.

TASK # 39

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Safety

TASK: Acquire a Knowledge of General Lab Safety.

CRITERION REFERENCED MEASURE: List and explain the general lab safety rules.

PERFORMANCE GUIDES:

1. Read the text assignment on safety.
2. Observe class presentations.
3. Participate in class discussions.
4. Always practice safety rules.
5. List the safety rules for a woodworking laboratory.

TASK # 40

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Design

TASK: Acquire a Knowledge of Design.

CRITERION REFERENCED MEASURE: Demonstrate an understanding of design principles including line, shape, mass, color, tone, texture, proportion, balance, harmony, rhythm, and symmetry.

PERFORMANCE GUIDES:

1. Read the text assignment on design.
2. Observe class presentations.
3. Practice drawing or sketching objects using the listed design principles.
4. Use good design principles in planning projects.

TASK # 41

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Common Cuts

TASK: Acquire a Knowledge of the Common Machine Cuts.

CRITERION REFERENCED MEASURE: Demonstrate a knowledge of the common machine cuts including a groove or plough, dado, rabbet, chamfer, bevel, miter, taper, mortise and tenon.

PERFORMANCE GUIDES:

1. Read the text assignment on common cuts.
2. Observe class presentations.
3. Participate in class discussions.
4. Observe the training film on wood cuts.
5. Practice making common cuts.

TASK # 42

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Planer/Surfacer.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the planer/surfacer and list the parts including - cutting feed selector handle, table, elevating hand wheel, infeed roll, chip breaker, cutterhead, gib, knife, pressure bar, and outfeed roll.

PERFORMANCE GUIDES:

1. Read the text assignment on the planer/surfacer.
2. List the safety precautions for the planer/surfacer.
3. Observe the class presentations.
4. Take part in class discussions.
5. Practice identifying the parts of the planer/surfacer.
6. Read the operating instructions for the planer/surfacer.
7. Observe training films on the operation of the planer/surfacer.

TASK # 43

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Jointer.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the jointer including identifying the following parts - in feed table, out feed table, guard, fence, fence adjusting handle, front table adjusting wheel, rear table adjusting wheel, depth of cut scale, and switch.

PERFORMANCE GUIDES:

1. Read the text assignment on the jointer.
2. Read the operating instructions on the jointer.
3. List the safety precautions for the jointer.
4. Observe class presentations.
5. Take part in class discussions.
6. List the parts of the jointer.
7. Observe the training film on jointer operation.
8. Practice using the jointer.

TASK # 44

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Circular Saw.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the circular saw including the following cuts - bevel, chamfer, taper, miter, groove, dado, rabbet, tenon, tongue and groove.

PERFORMANCE GUIDES:

1. Read the text assignment on the circular saw.
2. Read the operating instructions for the circular saw.
3. List the safety precautions for the circular saw.
4. Observe the class presentations.
5. Take part in class discussions.
6. Practice identifying the parts.
7. Observe the training film on circular saw cuts.
8. Practice using the circular saw.

TASK # 45

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Wood-turning Tools

TASK: Acquire a Knowledge of Wood-turning Tools.

CRITERION REFERENCED MEASURE: Demonstrate a knowledge of wood-turning tools including a skew, gouge, spear point, flat nose, round nose, and parting tool.

PERFORMANCE GUIDES:

1. Read the text assignment on wood-turning tools.
2. Observe the class presentations.
3. Participate in class discussions.
4. Make a list of the tools and their purposes.
5. Sharpen the tools for lathe use.

TASK # 46

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Wood Lathe.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the wood lathe and describe the parts including - the head stock, indexing pin, tool rest base, tool rest, lathe bed, tail stock, tail stock spindle clamp, set over screw, hand wheel, drive center, headstock cone pulley, and adjustable center pin.

PERFORMANCE GUIDES:

1. Read the text assignment on the lathe.
2. Observe class presentations.
3. Read the lathe operating instructions.
4. Participate in class discussions.
5. Practice identifying the parts.
6. List the lathe operating safety precautions.
7. Observe training films on lathe operation.
8. Practice using the lathe.

TASK # 47

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Oscillating Spindle Sander.

CRITERION REFERENCED MEASURE: Demonstrate the safe and correct operation of the oscillating spindle sander.

PERFORMANCE GUIDES:

1. Read the text assignment.
2. Observe the class demonstrations.
3. Take part in class discussions.
4. Practice using the sander.

TASK # 48

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Radial Arm Saw.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the radial arm saw and identify the following parts - in-feed table, out-feed table, guard, fence, fence adjusting handle, front table adjusting wheel, rear table adjusting wheel, depth of cut scale, and switch.

PERFORMANCE GUIDES:

1. Read the text assignment.
2. Read the operating instructions on the radial arm saw.
3. List the safety precautions for the radial arm saw.
4. Observe class presentations.
5. Take part in class discussions.
6. Practice identifying the parts of the radial arm saw.
7. Observe the training film on radial arm saw operation.
8. Practice using the radial arm saw.

TASK # 49

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Shaper.

CRITERION REFERENCED MEASURE: Demonstrate skill in using the shaper including identifying the following parts - spindle, 3-knife safety cutterhead, miter gage and sliding jig groove, expension wing, table, spindle raising wheel, and wheel lock.

PERFORMANCE GUIDES:

1. Read the text assignment on the shaper.
2. Read the operating instructions for the shaper.
3. List the safety precautions for the shaper.
4. Observe the class presentations.
5. Practice identifying the parts.
6. Take part in class discussions.
7. Observe the training film on shaper operation.
8. Practice using the shaper.

TASK # 50

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Router.

CRITERION REFERENCED MEASURE: Demonstrate edge moulding, dove tailing, and dadoing skills with the router.

PERFORMANCE GUIDES:

1. Read the text assignment on the router.
2. Observe the class presentations.
3. Participate in class discussions.
4. Observe the training film on router operations.
5. Practice using the router.

TASK # 51

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Machine Tools

TASK: Develop Skill in Using the Belt and Disc Sander.

CRITERION REFERENCED MEASURE: Safely rough sand stock using the belt and disc sander.

PERFORMANCE GUIDES:

1. Read the text assignment on the belt and disc sander.
2. Observe the class presentations.
3. Participate in class discussions.
4. List the safety precautions for the belt and disc sander.
5. Practice using the belt and disc sander.

TASK # 52

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT: Power Tools

TASK: Develop Skill in Using the Portable Circular Saw.

CRITERION REFERENCED MEASURE: Plunge cut, bevel cut, rip, and cross cut using the portable circular saw.

PERFORMANCE GUIDES:

1. Read the text assignment on the portable circular saw.
2. Observe the class presentations.
3. Take part in class discussions.
4. Practice using the portable circular saw.

TASK # 53

AREA OF COMPETENCE: Woodworking II

CONTENT/CONCEPT. Cabinet Making

TASK: Acquire a Knowledge of Cabinet Construction.

CRITERION REFERENCED MEASURE: Describe cabinet construction including case construction, leg and rail construction, carcass construction, drawer construction, and built-ins.

PERFORMANCE GUIDES:

1. Read the text assignment on cabinet making.
2. Observe the class presentations.
3. Take part in class discussions.
4. List the different types of construction.
5. Participate in possible field trips.