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This institute focused on manufacturing industries for junior high industrial arts. It was attended by 20 teachers from 14 states who worked in four groups to develop pairs of instructional units titled "Introduction to Technology and Industrial Arts." Each of these units covers personnel management, engineering, production, finance, and marketing and was to be suitable for a "Laboratory of Industries" approach. Included were purposes, pupil activities, suggested content, and an evaluation unit. These units were tested on 60 boys and girls and video tapes were made and evaluated by the participants. (EM)

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Units for the
LABORATORY OF INDUSTRIES

Developed at an Institute
authorized under Title XI of NDEA
in cooperation with
U. S. Office of Education

July 1, 1968-August 9, 1968

Dr. John Mitchell
Institute Director

Department of Industrial Education and Technology

Gorham State College of the University of Maine
Gorham, Maine

August 1968

VT 007 844

INTRODUCTION

The efficient and effective implementation of a program of industrial arts reflective of industry and technology, especially in a "Laboratory of Industries" (Comprehensive General Shop) has been of major concern to both teachers and teacher educators. The procedures generally used have, in large measure, resulted in programs becoming too project-centered with little if any relationship to the overall objectives of industrial arts. Several methods have been used with varying degrees of success, but the true values and functions of the Laboratory of Industries have not, until recently, been recognized or realized.

The curriculum innovation in Maine, based upon the broad industrial classifications of Manufacturing, Construction, Power-Transportation, Electricity-Electronics, and Service has been made functional and operational through the unit method of organization and instruction. The unit, as used, has been defined "as a means of organizing instructional activities and materials into larger, related, and unified patterns of learning in order to achieve significant educational objectives." It usually provides a comprehensive coverage of a theme or problem, occupies more than one class period, includes a variety of learning activities and materials, and allows for cooperative teacher-pupil planning.

The unit method is simply one whereby the work of the semester or year is divided into a series of inter-related, flexible units, each having a unifying element or central theme toward which the activities or learning experiences are directed. In the Laboratory of Industries, the unit cuts across the arbitrary dividing lines which usually exist between subject areas, reduces to a minimum the piece-meal learning of unrelated, isolated skills or facts, and provides learning experiences in which the slow learner will find himself, on one hand, and the most gifted will be challenged on the other.

Spurred on by the success of this method in both junior and senior high schools in Maine, and by the need to reaffirm the role of the Laboratory of Industries, an NDEA Institute was proposed and held at Gorham State College. It concerned itself primarily with the Junior high school level and with the study of Manufacturing Industries.

Twenty general industrial arts teachers representing fourteen states from Maine to California participated in the Institute. During the first two weeks, they were oriented to newer educational developments, teaching methods, and unit organization. They were divided into four teaching teams and each then prepared a unit titled "Introduction to Technology and Industrial Arts." These were to be used during the

three week practicum which followed and at which time they were to be evaluated.

Sixty pupils, boys and girls, who were to enter grades 7, 8, and 9 in the Gorham Schools volunteered to participate in the practicum. None had prior experience in industrial arts. They were divided into four heterogeneous classes by grade level, with two 8th grades. The classes met for an hour and twenty minutes daily, or the equivalent of three 40 minute periods per week for 15 weeks. Major portions of each class were video-taped to provide for subsequent evaluation.

While the first units were nearing completion, work was begun on the second units. Sufficient time was provided each team to view the video tapes and evaluate their work; to conduct research and develop their units; and to prepare lessons and teaching materials for the next class session. Each of the units was developed to serve both the purposes of the Institute practicum and the teacher's own situation. Consequently, they contain information, activities, and resources that can be used by junior high school teachers in any geographic area who are concerned with a study of manufacturing industries.

The selection of unit titles is based not only upon pupil interests but also on representative manufacturing industries. These provided the central or unifying themes. They may be retained or changed for those more appropriate to the interests of the pupils in the teacher's locale. However, the basic concepts or functions of manufacturing industries; namely, personnel management, engineering, production, finance, and marketing should be maintained. The degree to which understanding of these concepts will be acquired is reflected in the terminal behaviors, the activities provided, and the teacher's lessons which should be guided by the abilities or aptitudes of the pupils and the time limitations. It should be noted that only three objectives of industrial arts have been considered and analyzed. These are concerned with understandings, skills, and attitudes or appreciations. All other objectives are subsumed within these three.

The units used in the Institute practicum could not reflect the sequence possible inasmuch as none of the classes had prior experience. In the teacher's own school, succeeding units within each grade level should attempt to provide new experiences and increasing depths of information and skills so that a spiraling curriculum may evolve.

While the accompanying units were designed for a Laboratory of Industries, they may be readily adapted to single area type laboratories such as wood or metal industries, by limiting the

study to the industry represented by the materials. The basic functions or concepts will remain the same but will concern themselves with the particular industry. The themes may be left unchanged but the manufactured products will be controlled by the material used.

Each unit is a complete teaching package containing purposes, pupil activities, approaches, instructional resources--including references, instructional aids and devices--suggested lessons and lesson content, and a final unit evaluation. Product plans and materials developed in and for the Institute are included and may be suggestive.

Recognition is given to Dr. James R. Hastings and his staff at Oswego State University College, New York, whose final report, "Field Study in Industry for the Preparation of Industrial Arts Teachers," provided significant materials which were either used or adapted for use in the units.

Special acknowledgment is given the Institute Staff, Dr. Arthur O. Berry, Asst. Director; John S. Greer, Full-time Instructor; and Messrs. Richard H. Carter and William C. Warren, Part-time Instructors, all of whom provided guidance and encouragement as each team's consultant.

A final tribute is given to each Institute participant who worked diligently and sincerely toward accomplishing the objectives of the Institute, and to the U. S. Office of Education which made it all possible.

Dr. John Mitchell, Director
August, 1968

TITLE OF UNIT

INTRODUCTION TO TECHNOLOGY AND INDUSTRIAL ARTS

TEACHING TEAM

EUGENE S. CHAPLIN
RICHARD O. GILPATRICK
JOHN KELLEY
DENNIS D. MAUST
FRANK W. REED

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

Technological development in the 20th century is proceeding at a rate of speed unheard of in the history of man. In America today, we depend upon technology to supply us with not only our basic needs, but all the luxuries we can demand of it. Although necessary to our way of life, this rapid development must be controlled, and to control it we must understand it. We can do this only by studying the environment within which it was created -- industry.

A historical study of American industry would reveal the need for technological advancement. An awareness of industry's role in creating and advancing technology must be an integral part of the educational development of our youth. Industry's influence is felt by everyone in our society and industrial arts, as a part of general education, has an obligation to provide a basic knowledge of industry to our youth. This knowledge must be imparted to pupils in order to better prepare them for the complexities of life.

SCOPE:

This unit will provide an introduction to industrial arts, industry and technology for junior high school pupils who have had no previous experience in this type of program.

This unit should be completed in one week of four single class periods or two double class periods. The unit may be adapted to all ability levels in the three grades of the junior high school.

OBJECTIVE 1: To develop an understanding of the meaning and purpose of industrial arts and its relationship to industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Recognize industrial arts as a part of general education 2. Recognize the need for industry in our society 3. Compare industrial arts with industry and technology 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. a. Discuss correlation of industrial arts with other subject matter 2. a. List local industries b. List articles of above c. Examine products and materials of local industries 3. a. Make paper product b. Visit small industry c. Tour shop 	<p>Industrial Arts and General Education</p> <p>The Role of Industry in our Society</p> <p>The Relationship Between Industry, Industrial Arts and Technology</p>

OBJECTIVE 2: To develop desirable attitudes towards the organization
and operation of the industrial arts program

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Recognize the need for proper conduct and safe practices in the industrial arts laboratory 2. - Demonstrate a knowledge of the administrative practices of the industrial arts laboratory 3. Analyze the physical arrangement of an industrial arts laboratory 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> a. Discuss rules for general safety in the laboratory b. View film 2. <ol style="list-style-type: none"> a. Complete student contract form b. Discuss laboratory practices 3. <ol style="list-style-type: none"> a. Participate in laboratory tour b. Discuss floor plan 	<p>Safe Practices in the Industrial Arts Laboratory</p> <p>Administration of the Industrial Arts Laboratory</p> <p>Physical Arrangement of the Industrial Arts Laboratory</p>

APPROACH:

1. Divide the pupils into groups and manufacture a simple product from paper. Using only a plain sheet of paper, they will be able to produce geometric designs -- animals, birds, airplanes, etc. This experience should assist in their gaining an understanding of "industry."
2. Arrange a display of materials and products of local industries.
3. Arrange a display of old and modern tools and use the chart "Tools That Created Civilization."
4. Exhibit pictures of industries and related material on the bulletin board.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Bethel, Lawrence, Industrial Organization and Management,
New York: McGraw-Hill Publishing Company, 1962.

Gerbracht, Carl and Frank E. Robinson, Understanding
America's Industries, Bloomington, Illinois: McKnight
and McKnight, 1958.

Maine State Department of Education, Industrial Arts
Technology, Augusta, Maine: The Department, 1965.

Olson, Delmar W., Industrial Arts and Technology,
Englewood Cliffs, New Jersey: Prentice-Hall, 1965.

Silvius and Curry, Teaching Successfully in Industrial
Education, Bloomington, Illinois: McKnight and
McKnight, 1967.

United States Department of Labor, Occupational Outlook
Handbook, Washington, D. C.: U. S. Government Printing
Office, 1967.

RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Chart, Tools That Created Civilization, Wilkie Foundation, Des Plaines, Illinois
2. Strip film, Basic Shop Safety, Jam Handy Corporation, Detroit, Michigan, \$5.00
3. Film, The Factory, University of Michigan, B & W, 13 mm., rental, Audio Visual Education Center, 416 4th Street, Ann Arbor, Michigan, \$4.50
4. Manufactured articles from local industries
5. Information sheets
 - a. Lab floor plan
 - b. "Industrious Art" work sheet
6. Job application form
7. Time card
8. Floor plan transparency

FILM REPORT AND GUIDE SHEET

Title of film Factory: How a Product is Made

Type: B & W * (COLOR) * SOUND * SILENT
Size: (16 mm) * 35 mm Projection Time _____

Order From: Indiana University, Bloomington
 University of Michigan, Ann Arbor

Cost of Loan Basis: \$4.50
Film Classification: Skill * Occupational * (Industrial) * Scientific * Technical
Learning Level: 1-6; (7) - 8 - 9 - 10 - 11 - 12; technical high;
 vocational; college engineering

Reason for Showing: This film was shown to aid in developing an understanding
 of the purpose of Industrial Arts and its relationship
 to industry

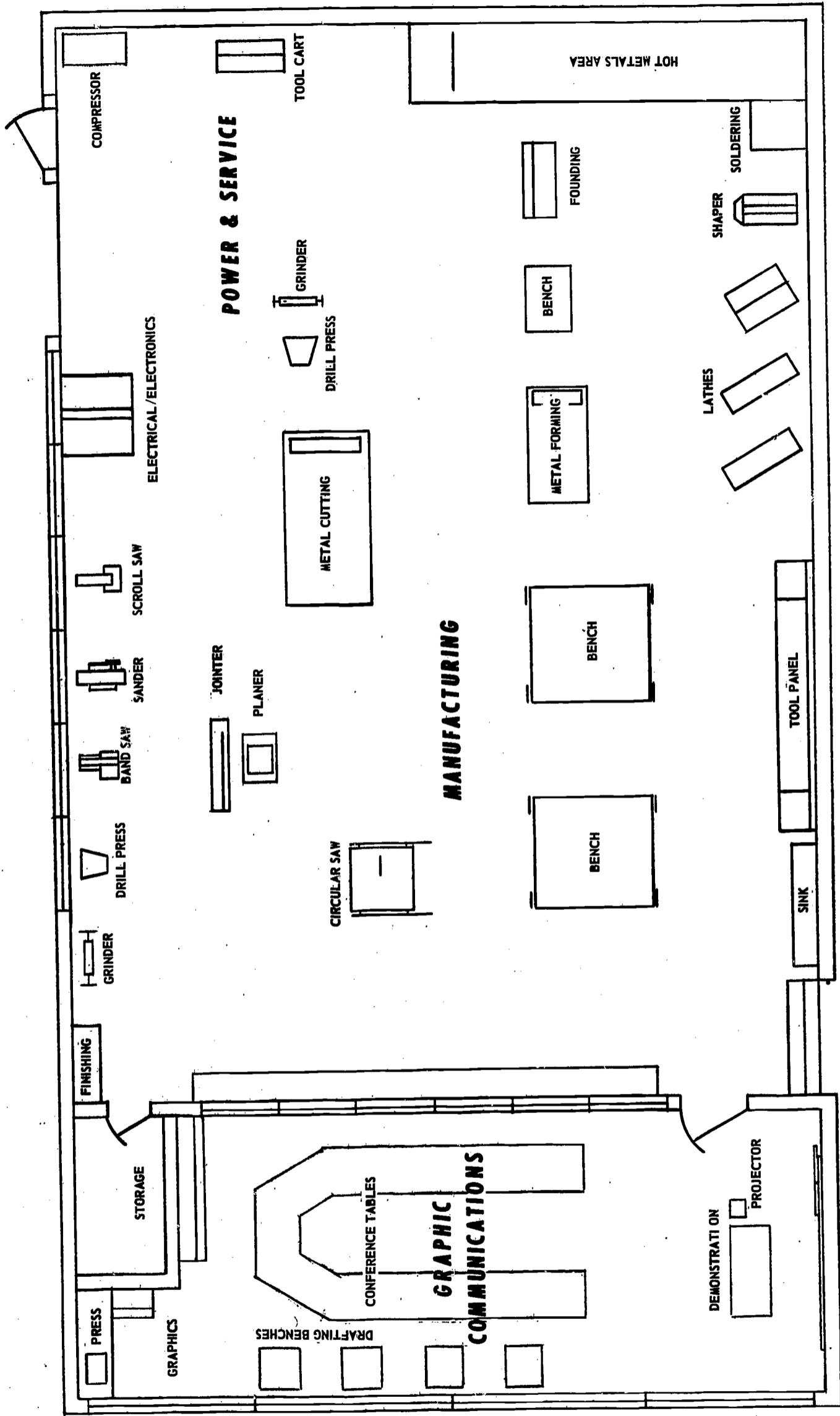
Synopsis of Film: A simple toy is taken from the planning board, through steps
 of manufacture, to its sale in a retail store

What to Look For: The steps industry takes to complete a product so that
 they can be related back to the Industrial Arts program

Evaluation and Comments:

	Excellent	Very Good	Good	Fair	Poor
1. Presentation (manner of)	X				
2. Timeliness (up to date)	X				
3. Accuracy (correct info)		X			
4. Clarity - Understanding	X				
5. Summarization	X				
6. Advertising (amount)	X				
7. Sound (clear, effective)			X		
8. Color (effective)		X			
9.					

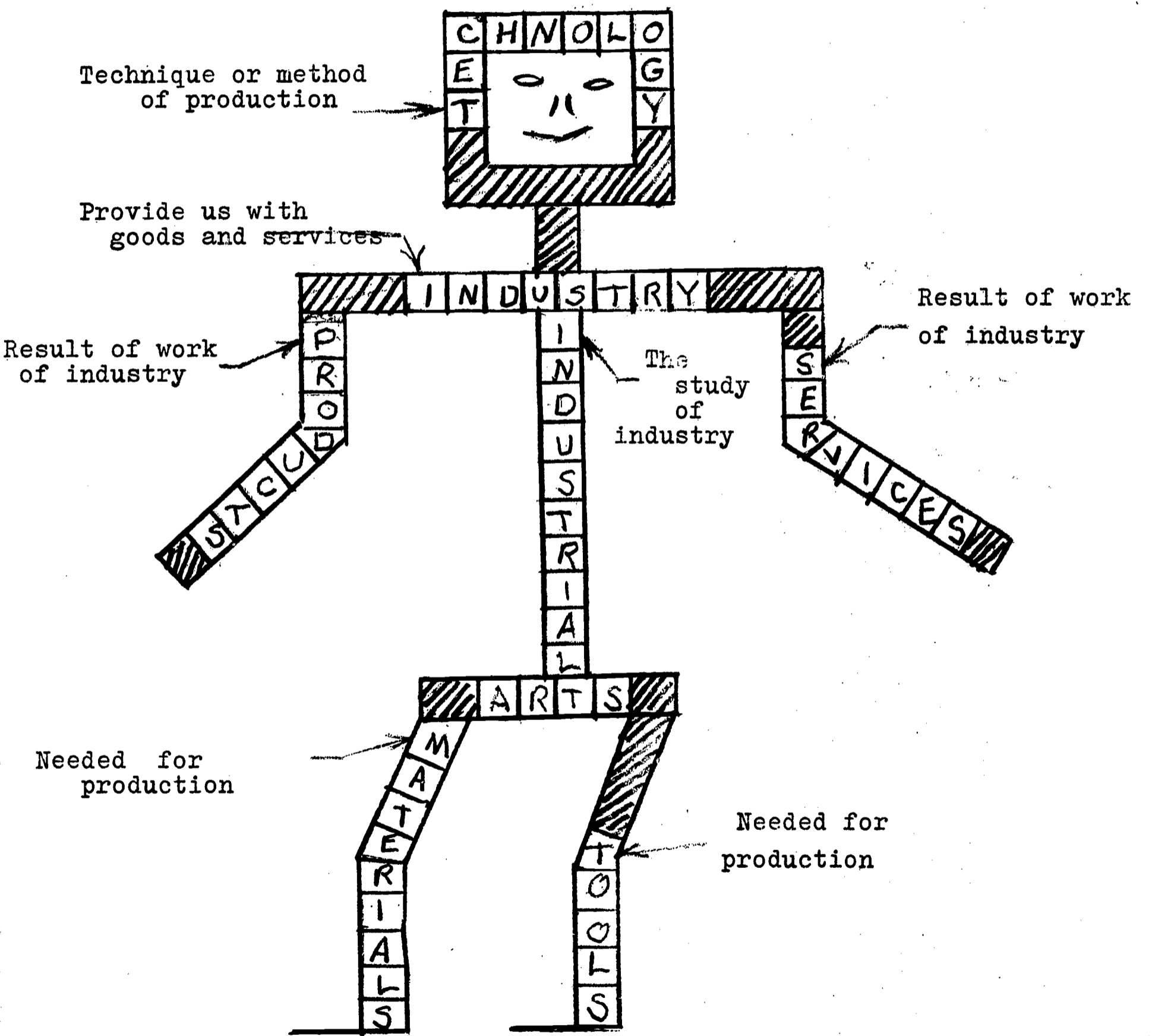
Comments: (on back) -- Questions, comments, preview notes



LABORATORY OF INDUSTRIES

GORHAM STATE COLLEGE

Put Muscles on Industrious 'Art'



JOB APPLICATION

Name of Employee _____ Address _____

Age _____ Sex: M _____ F _____ Phone _____

Father's Occupation _____

Mother's Occupation _____

List hobbies _____

Work experience (tools, machinery, etc.) _____

SAFETY RULES

1. Enter the room quietly and sit in assigned seat.
2. No horseplay while in the laboratory.
3. Use caution when handling tools.
4. Never leave the room without permission.
5. No running.
6. Wear proper safety apparel, such as aprons and safety glasses.

FIRE RULES AND REGULATIONS

In case of fire, leave the room by the door in the rear of the laboratory as quickly as possible. All employees must follow civil defense rules.

If employed, I agree to abide by the above regulations.

Signed _____

TIME CARD

NAME _____

	Week of		
	July 14	July 21	July 28
SUN.			
Mon.			
Tues.			
Wed.			
THUR.			
FRI.			
Sat.			

TOOLS AND EQUIPMENT:

1. Tools found in a typical industrial arts laboratory.
2. Overhead projector
3. Viewing screen
4. Movie projector
5. Film strip projector

MATERIALS AND SUPPLIES:

This being an introductory unit, no special materials and supplies are needed for its implementation.

LESSONS TO BE TAUGHT:

Industrial Arts and General Education

The Role of Industry in our Society

The Relationship Between Industry, Industrial Arts and
Technology

Administration of the Industrial Arts Laboratory

Safe Practices in the Industrial Arts Laboratory

Physical Arrangement of an Industrial Arts Laboratory

Title: Industrial Arts and General Education

Presentation:

- I. Introduce team to class
 - A. Write names of team on chalkboard
 - B. Have each team member stand as name is called
- II. Read names of class members
 - A. Have students stand and tell where they live
 - B. Discussion
- III. Ask what students expected when they signed up for course
 - A. Call on individual students for response
 - B. Discussion
- IV. Show where industrial arts fits into broad field of general education
 - A. Major subject areas
 1. Math
 - a. Measurement
 - b. Formulas
 - c. Shapes
 2. Science
 - a. Experiments
 - b. Practical application
 - c. Chemicals
 3. English
 - a. Reading and writing
 - b. Job application
 - c. Communication
 4. Social studies
 - a. Development of tools and machines
 - b. Industrial Revolution
 - B. Have students participate in discussion

Title: The Role of Industry in our Society

Presentation:

I. Define industry

- A. Industry is organization or society
- B. Purpose is to produce goods and services

II. Common types

- A. Manufacturing
- B. Construction
- C. Service

III. Needs of industry

- A. Raw materials
- B. Machines and tools
- C. Money
- D. People to work
- E. Factories

IV. Need for industries

- A. Products and services
- B. Jobs
- C. Money

References:

Delmar W. Olson, Industrial Arts and Technology, pp. 61-66

Carl Gerbracht and Frank E. Robinson, Understanding America's Industries, pp. 2-5

Title: The Relationship Between Industry, Industrial Arts and Technology

Presentation:

I. Define industry, industrial arts and technology

- A. Produces goods and services
- B. Study of industry
- C. Technique or systematic method of production

II. Industrial arts and industry

- A. Place of industry in our society
- B. Types of
- C. Organization
- D. Materials used
- E. Products
- F. Processes

III. Technology and industry

- A. Early history of industry
- B. Mass production and automation of modern industries

References:

Lavon B. Smith and Marion E. Maddox, Elements of American Industry, pp. 256-259.

Title: Administration of the Industrial Arts Laboratory

Presentation:

I. Student contract form

A. Explain job application

1. Personal data
2. Student competencies

B. Relate to industry

1. How to fill out application
2. Interview

II. Time card

A. Attendance record

B. Relate to industry

III. Identification card

A. Communication in laboratory

B. Department assignment

1. Engineering
2. Production
3. Marketing

C. Relate to industry

1. Entrance to plant
2. Department identification

IV. Assign student number and locker

A. Number

1. Instruction seat
2. Locker compartment
3. Tool checks (if necessary)

B. Locker

1. Apron
2. Plans
3. Materials

References:

Harold G. Silvius and Estell H. Curry, Teaching Successfully in Industrial Education, pp. 220-251.

Title: Safe Practices in the Laboratory

Presentation:

- I. Why is safety important in our lives?
 - A. Safety on the highway
 - B. Safety in our homes
- II. Safety in the industrial arts laboratory
 - A. Safety is really common sense
 - B. Personal habits
 1. Attitude about safety
 2. Clothing
 - a. Remove sweaters
 - b. Wear a shop apron
 3. Keep hands clean
 4. Always walk in the laboratory
 5. Horseplay not tolerated, no fooling around
 6. Report any injuries immediately
 - C. General safety rules
 1. Avoid putting nails, etc., in the mouth
 2. Leave vises in a closed position
 3. Store products in a safe place
 4. Keep oily rags in a covered metal container
 5. Keep floors clean
 - D. Tool safety
 1. Carry tools with the points down
 2. Never put tools in your pocket
 3. Hand tools to others by the handle first
 4. Report broken or damaged tools to instructor
 5. Wear safety glasses when working on dangerous tools or machines
 6. Respect power machines and persons operating them

References:

Harold G. Silvius and Estell H. Curry, Teaching Successfully in Industrial Education, pp. 397-484.

Title: Physical Arrangement of an Industrial Arts Laboratory

Presentation:

I. Compare activities of classroom with those of laboratory

A. Classroom

1. Organize ourselves
2. Decide on products
3. Plan construction
4. Terms: planning and designing

B. Laboratory

1. Make products
2. Term: manufacture

II. Point out location of materials and supplies

A. Wood, metal, plastics and leather

B. Nuts, bolts, wood screws, washers, etc.

III. Illustrate factors affecting laboratory arrangement

A. Convenience

B. Safety

IV. Point out section of laboratory where pupils will carry on most of their activities

A. General purpose benches

B. Tool panel - hand tools

V. Describe laboratory as a place of vast activities

A. Many materials used

B. Many operations carried on

References:

Maine State Department of Education, Industrial Arts Technology,
pp. 10-17.

TITLE OF UNIT

THE PERSONAL ACCESSORIES MANUFACTURING INDUSTRIES

TEACHING TEAM

EUGENE S. CHAPLIN
RICHARD O. GILPATRICK
JOHN E. KELLY
DENNIS D. MAUST
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N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

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INTRODUCTION:

Never satisfied with things as they are, humans have labored ceaselessly to ornament their homes, their furniture, their garden plots, and their own person. The desire for handsome rings, pins, bracelets, necklaces, wallets, handbags, coil purses and other forms of personal accessories is common to all people in all lands and all eras.

This desire of people is emphasized by the fact that more than 25,000 persons were employed in jewelry sales and repairs and related industries in the United States during 1965. This and other areas, such as leather, metal, wood and plastic accessories and novelties production, is satisfying the need for people to adorn themselves and provide gifts for others.

The industry may be of corporation size, but more often it is a single ownership or partnership type of organization. A study of this industry provides the pupil with the opportunity to experience all the basic functions of the major manufacturing industries.

The interests of the beginning industrial arts pupil have very definite leanings toward the personal item for himself or as a gift for a relative or friend. Pupils at this level also have a limited interest span. Therefore, the small personal accessory will provide for adequate learning of skills and attitudes necessary in industrial arts and general education. Through a strong pupil interest factor, it will be possible to develop basic understandings and appreciations concerning the broad field of manufacturing and industrial technology as we know it today.

SCOPE:

This unit is designed for seventh grade students who have had no previous experience in industrial arts. The length of the unit would be five to six weeks, forty-five minutes in length, and five periods per week. This unit, with minor modification, could be adapted to any ability level. The major emphasis is on single ownership and custom production.

OBJECTIVE 1: To develop an insight to and an understanding of the personal accessories industries and its place in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Recognize various products of the personal accessories industry and materials used 2. Recognize the need for the industry in our society 3. Recognize the scope of the industry 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> a. List various products of the personal accessories industry b. Research catalogues, magazines, and newspapers for product ideas 2. <ol style="list-style-type: none"> a. Discuss job opportunities and occupations b. Visit gift shops, novelty stores, jewelry stores, etc. c. Discuss custom of giving gifts 3. <ol style="list-style-type: none"> a. State hobbies that are concerned with personal accessories 	<p>The Personal Accessories Industry and its Place in Our Society</p>

OBJECTIVE 1: To develop an insight to and an understanding of the personal accessories industries and its place in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>4. Relate the function of industry to the Industrial Arts laboratory</p>	<p>Have pupils:</p> <p>3. b. Discuss personal accessories for profit making (small and large businesses)</p> <p>4. a. Construct a chart of the functions of industry</p> <p>b. Visit an industry and analyze the product manufacturing sequence</p>	<p>The Functions of Industry</p>

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Follow a logical procedure in selecting a personal accessory 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. a. Describe procedures used in selecting a product b. Bring in product ideas c. Select product 	<p>Market Research and Product Development</p>
<ol style="list-style-type: none"> 2. Apply principles of design to a personal accessory 	<ol style="list-style-type: none"> 2. a. Bring design samples to class b. Examine products for various design ideas c. Develop a design for a personal accessory 	<p>Industrial Forms of Design</p>
<ol style="list-style-type: none"> 3. Select materials best suited for his design 	<ol style="list-style-type: none"> 3. a. Inspect various materials b. List material on production plan 	<p>Materials Procurement and Control</p>

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>4. Organize a production guide using the functions of industry</p>	<p>Have pupils:</p> <p>4. a. Analyze a product for manufacturing processes</p> <p>b. Make out an industrial production guide</p>	<p>How to Prepare an Industrial Production Guide</p>
<p>5. Recognize and use basic layout tools</p>	<p>5. a. Make list of layout tools they will use</p> <p>b. Layout design on material</p>	<p>How to Layout on Flat Stock</p>
<p>6. Recognize and use basic cutting tools</p>	<p>6. a. Identify cutting tools</p> <p>b. Cut out design on material</p>	<p>How to Cut Flat Stock</p>
<p>7. Recognize and use basic shaping tools</p>	<p>7. a. View demonstration on shaping.</p> <p>b. Shape material</p>	<p>How to Shape Flat Stock</p>

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>8. Recognize and use basic forming tools</p> <p>9. Recognize and use basic assembly tools and materials</p> <p>10. Recognize and use basic finishing materials and tools</p> <p>11. Recognize the need for proper packaging and labeling of a product</p>	<p>Have pupils:</p> <p>8. a. Experiment with forming tools on materials</p> <p>b. Form material</p> <p>9. a. Assemble product</p> <p>b. Test bonding materials for strength</p> <p>10. a. Experiment with sample finishes</p> <p>b. Finish product</p> <p>11. a. Make a card, slip or box for packaging a personal accessory</p> <p>b. Package personal accessory</p>	<p>How to Form Flat Stock</p> <p>How to Use Assembly Tools and Materials</p> <p>Finishing Methods and Tools Used in the Manufacture of Personal Accessories</p> <p>How to Copper Enamel</p> <p>Packaging Products in the Personal Accessories Industry</p>

OBJECTIVE 2: To discover and develop the ability of youth in the technical field through problem solving in the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>12. Recognize the importance of marketing and pricing in the personal accessories industry</p>	<p>Have pupils:</p> <p>12. a. Prepare a sample advertising poster</p> <p>b. Give a commercial to the class</p>	<p>Pricing and Marketing Techniques Used in the Personal Accessories Industry</p>

OBJECTIVE 3: To develop desirable attitudes toward the worker and the products of the personal accessories industry

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate safe work habits. 2. Function adequately as a member of an organized group 3. Show desirable attitudes in the use, care and construction of personal accessories 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. Use tools and materials with a reasonable degree of safety 2. <ol style="list-style-type: none"> a. Take part in personnel organization b. Work with other pupils in the laboratory 	<p>Industrial Organization and Management</p>

APPROACH:

1. Have pupils survey books, magazines, catalogs, and other materials to compile a list of personal accessories.
2. Arrange a display of types of common personal accessories.
3. Arrange a field trip to a gift shop, jewelry store, or handicraft or hobby store.
4. Invite a representative of a jewelry and novelty industry to speak to the group.
5. Have students discuss what personal accessory he or she could use.
6. Have students state what personal accessories their brothers and sisters, as well as their mother and father possess.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

- American Handicrafts Company, Clear Cast Instructor's Manual, Fort Work, Texas; 1968.
- American Handicrafts Company, Instructor's Manual, Fort Worth, Texas, 1967.
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- Bethel, Lawrence, Industrial Organization and Management, New York: McGraw-Hill, 1962.
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RESOURCE MATERIALS:

A. TEACHING AIDS AND DEVICES

1. Information sheets

- a. Typical products of the Personal Accessories Industry
- b. Stock price list
- c. Purchase requisition form
- d. Personnel organization job requirements
- e. Personnel organization chart
- f. Links of industry
- g. Industrial production guide
- h. Functions of industry chart

2. Information sheets used for overhead transparency

- a. Abrasive particles
- b. Line organization chart
- c. Line and staff organization chart
- d. General procurement procedures
- e. Material acquisition and recording procedures
- f. Levels of management chart
- g. Levels and flow of authority
- h. Marketing interrelationship

TYPICAL PRODUCTS
OF THE
PERSONAL ACCESSORIES INDUSTRY

Woods

Pins
Earrings
Bracelets
Name plate
Laminated pendants

Metals

Copper enameled
Earrings
Pins
Tie clasp
Rings (planished)
Bracelet (planished)

Plastics

Earrings
Bracelets
Zipper pulls
Rings
Tie clasps
Pins
Key tags
Name plates

Leather

Coin purse
Keycase
Comb case
Earrings
Cuff links
Belts
Head bands
Pony tail harness

Name _____

MARKET SURVEY

AREA (wood, metal, etc.)	PRODUCT

PERSONAL ACCESSORIES INDUSTRY

STOCK PRICE LIST

Material

Price per Square Inch

Metals

Aluminum

Copper

Plastic

Sheet

Liquid cast

Leather

Wood

Pine

Mahogany

Walnut

Bead Chain

Bead Chain

Pin

PERSONAL ACCESSORIES INDUSTRY

PURCHASE REQUISITION

Department _____

Requisition Number _____

Date _____

Requested by _____

Approved by _____

Checked by _____

Please provide the following:

Date material is needed _____

QUANTITY	DESCRIPTION Size, color, material	Number of units	Unit Cost	Total Cost
	Purchased Parts			

Instructions:

PERSONAL ACCESSORIES INDUSTRY

PERSONNEL ORGANIZATION JOB REQUIREMENTS

General Manager:

1. Signal end of work period.
2. Supervise personnel in laboratory clean-up.
3. Assign work of substitutes.
4. Report to instructor when all is complete.

Foremen:

1. Supervise assigned area.
2. Assist personnel as needed.
3. Report to general manager when personnel have finished.

Sweepers:

1. Sweep all floor areas.
2. Pick up and dispose of waste.
3. Report to foreman.

Benches:

1. Clean all benches.
2. Replace materials in proper storage.
3. Report to foreman.

Tools:

1. Return all tools to panels.
2. Dust tools and panels.
3. Report to foreman.

Substitutes:

1. Take place of absentees as assigned by general manager.
2. Do assigned job if no one is absent.

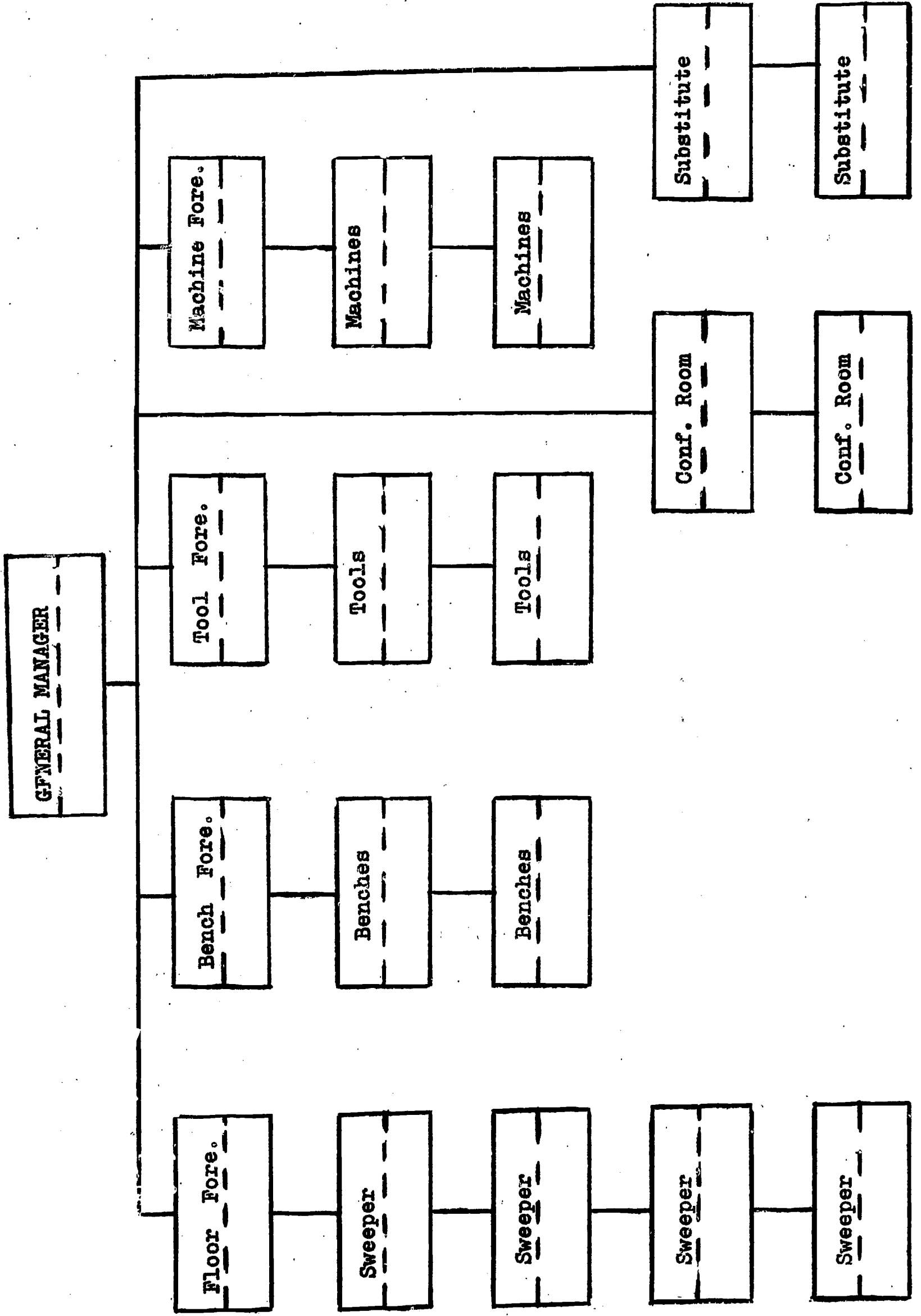
Conference Room:

1. Pick up work tables.
2. Arrange chairs and tables.
3. Clean chalkboard.
4. Report to general manager.

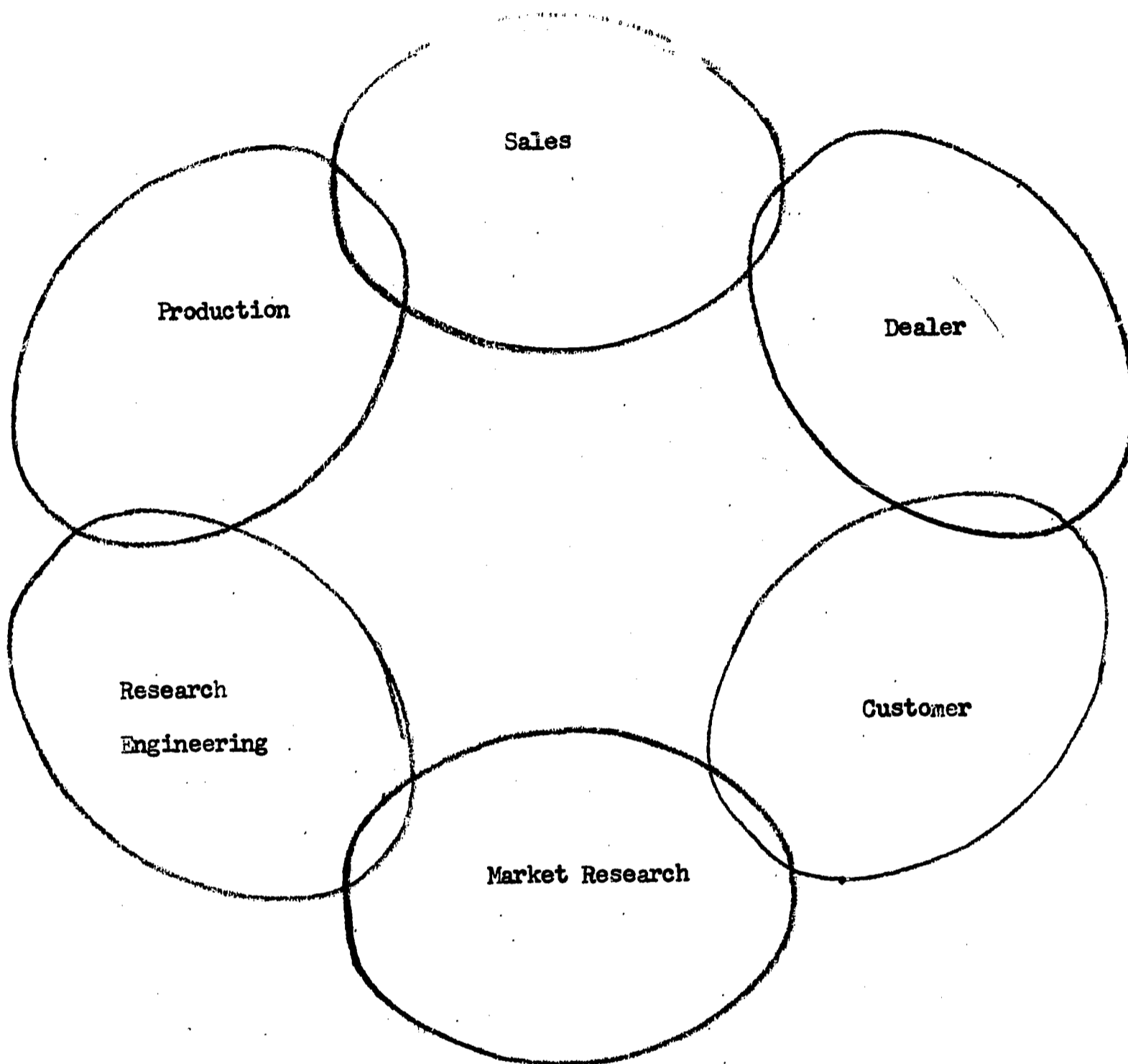
ORGANIZATION IS NECESSARY IF INDUSTRY IS TO FUNCTION PROPERLY.

THIS ORGANIZATION WILL FUNCTION AND BE SUCCESSFUL IF EACH
MEMBER DOES HIS BEST.

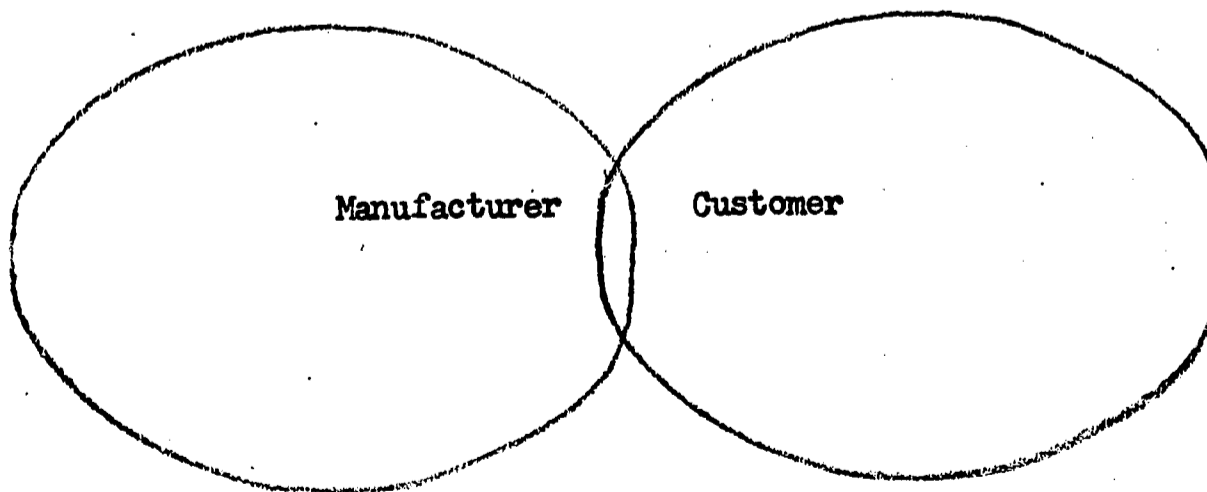
PERSONNEL ORGANIZATION



TEACHING AID
Linked to Industry
Linker of Industry



Large Industry



Lawrence L. Bethal, Franklin S. Atwater, Industrial Organization and Management

INDUSTRIAL DESIGNING PROCESS

Name _____

Product name _____

Do you have a NEED for this product?

R E S E A R C H

-are materials available ?

-is the cost reasonable ?

-are tools available ?

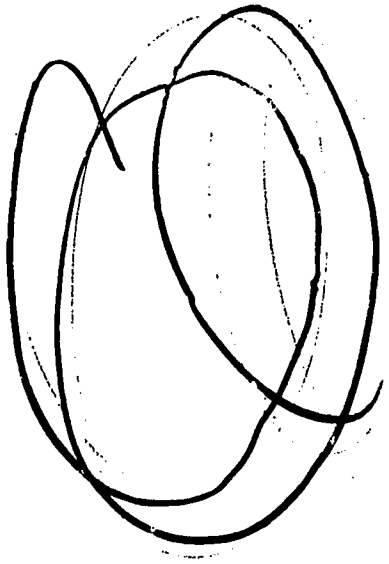
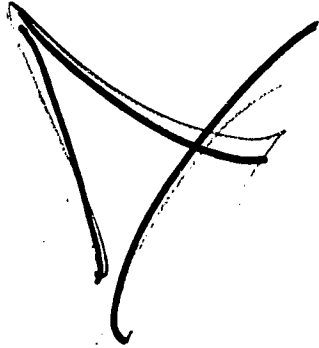
-is it within size limits ?

MAKE SKETCHES



MANUFACTURE

EXPERIMENT AND EVALUATE



Industrial Production Guide

Name: _____

Article to be produced: _____ Number: _____

Date Begun: _____ Date Finished: _____ Time Elapsed (hours): _____

Estimated Cost: _____ Approval to Start: _____

PRODUCTION STEPS

1. Make working drawing.

2. Make out bill of materials.

3. Make out Production Guide.

Pictorial Sketch

Research & Development Functions

Designing & Planning Functions

Manufacturing Functions

Material Selection

Layout

Cut

Form

Shape

Assemble

Finish

Inspection

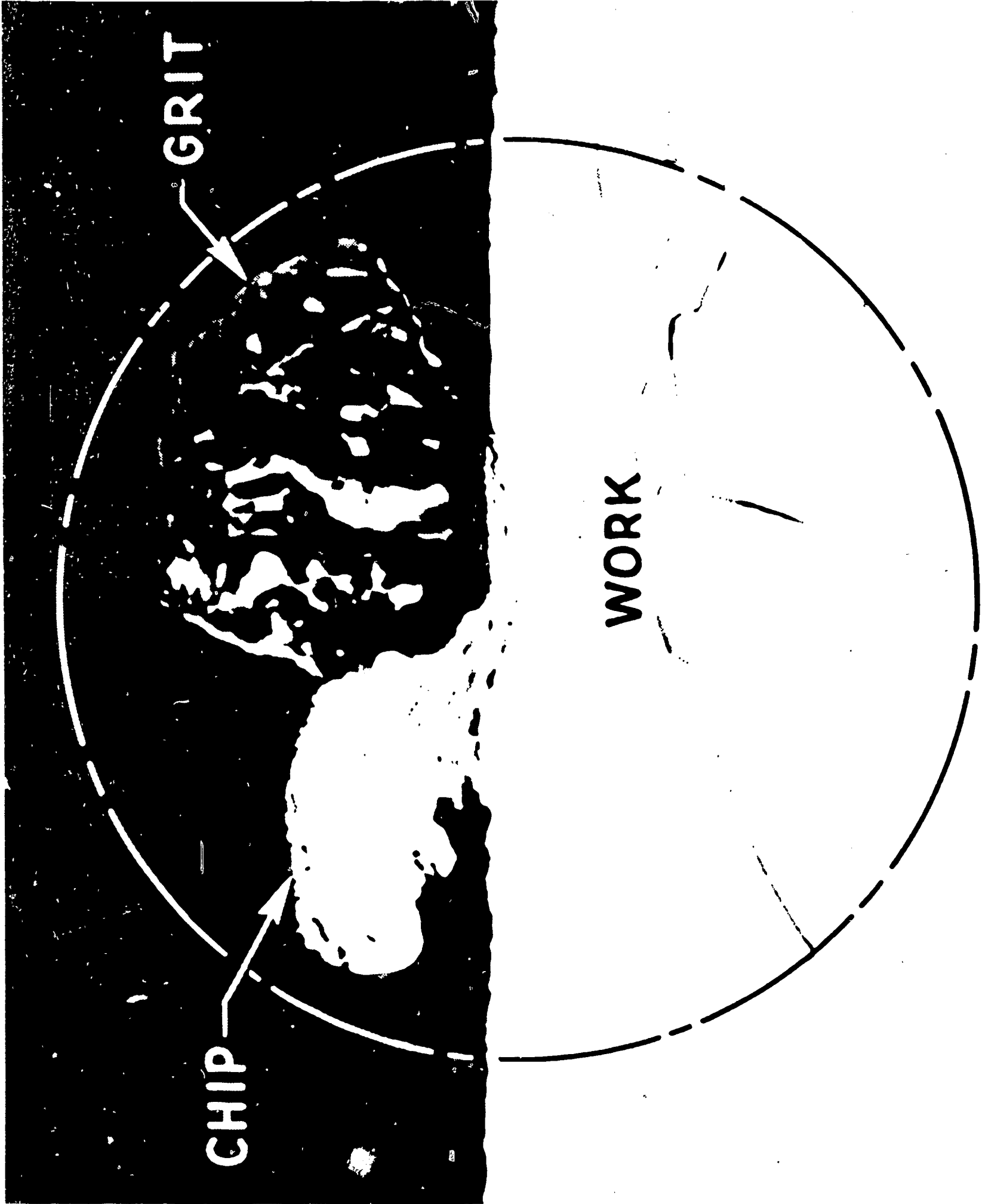
Distribution Functions

Package

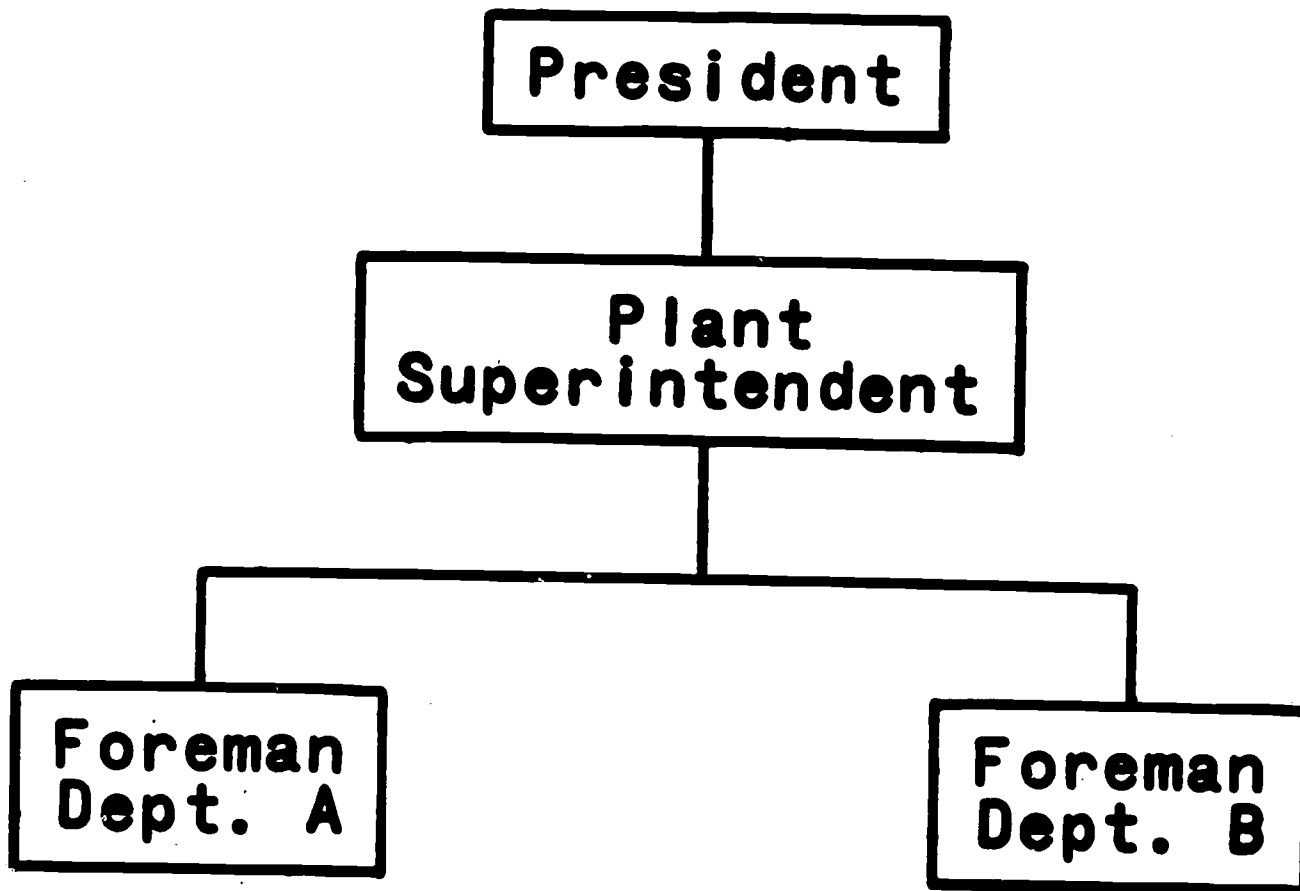
Ship

Sell

State of Maine Department of Education, Industrial Arts Technology, P.1.

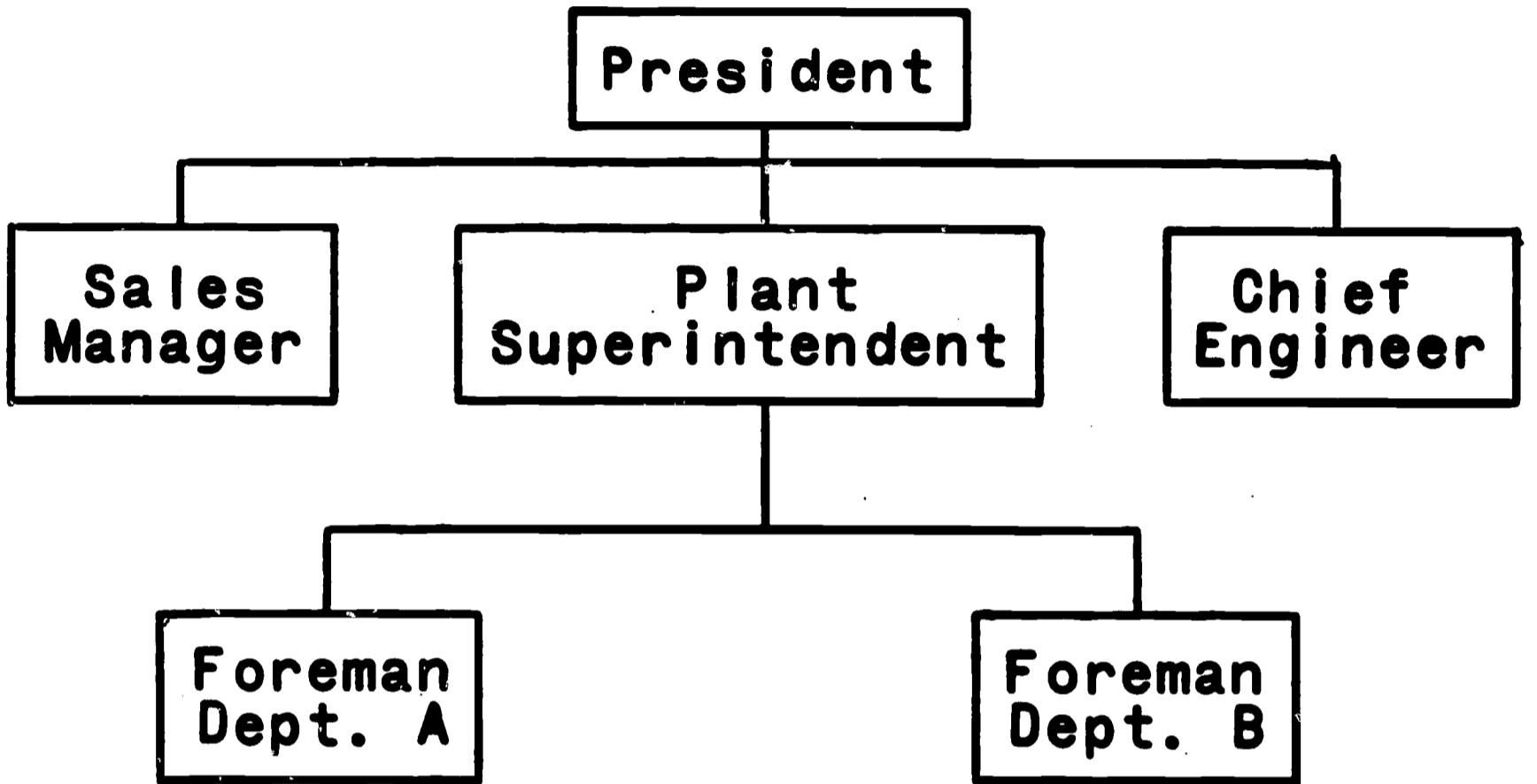


LINE ORGANIZATION



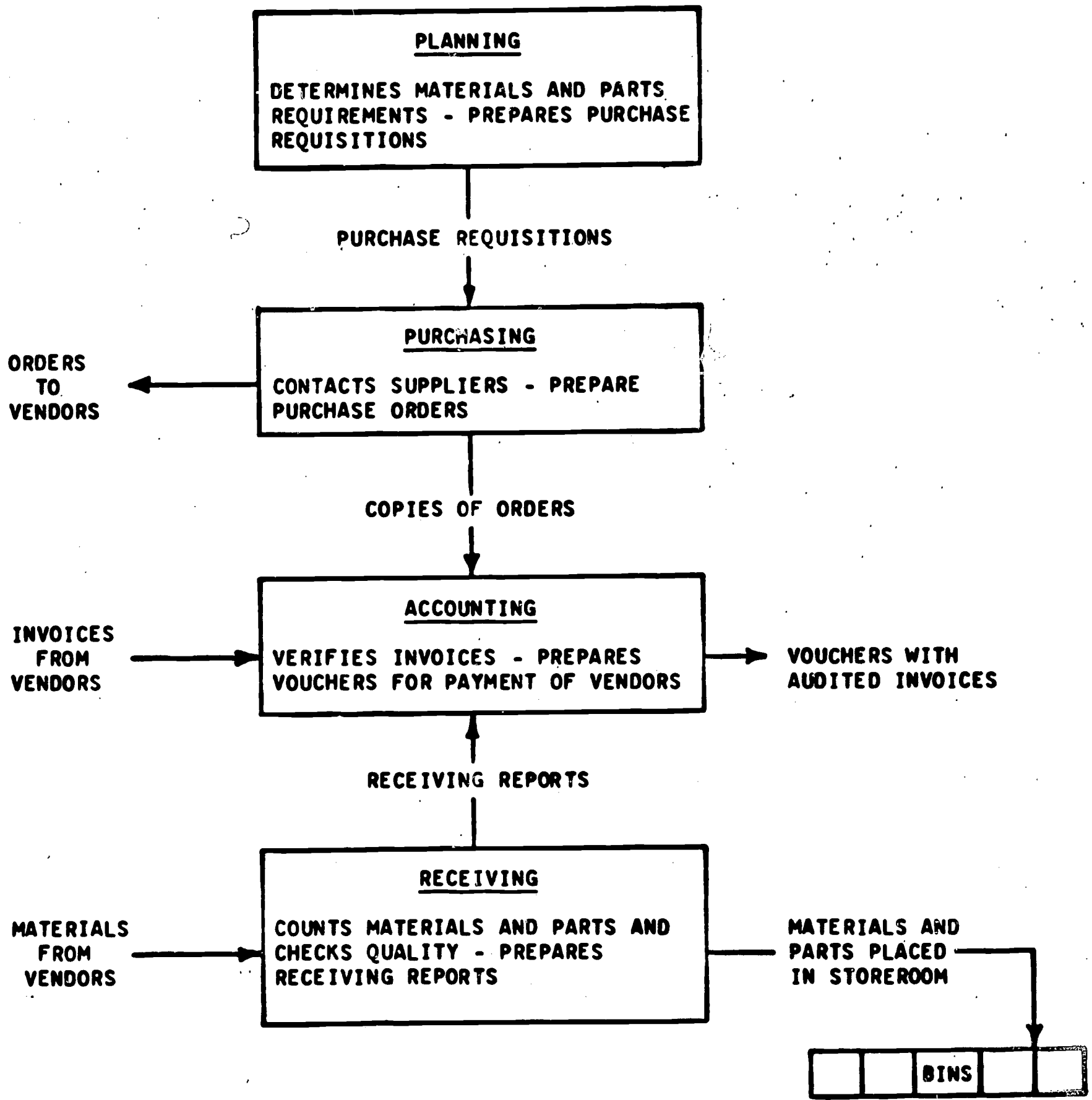
ANDREWS AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 94.

LINE AND STAFF ORGANIZATION



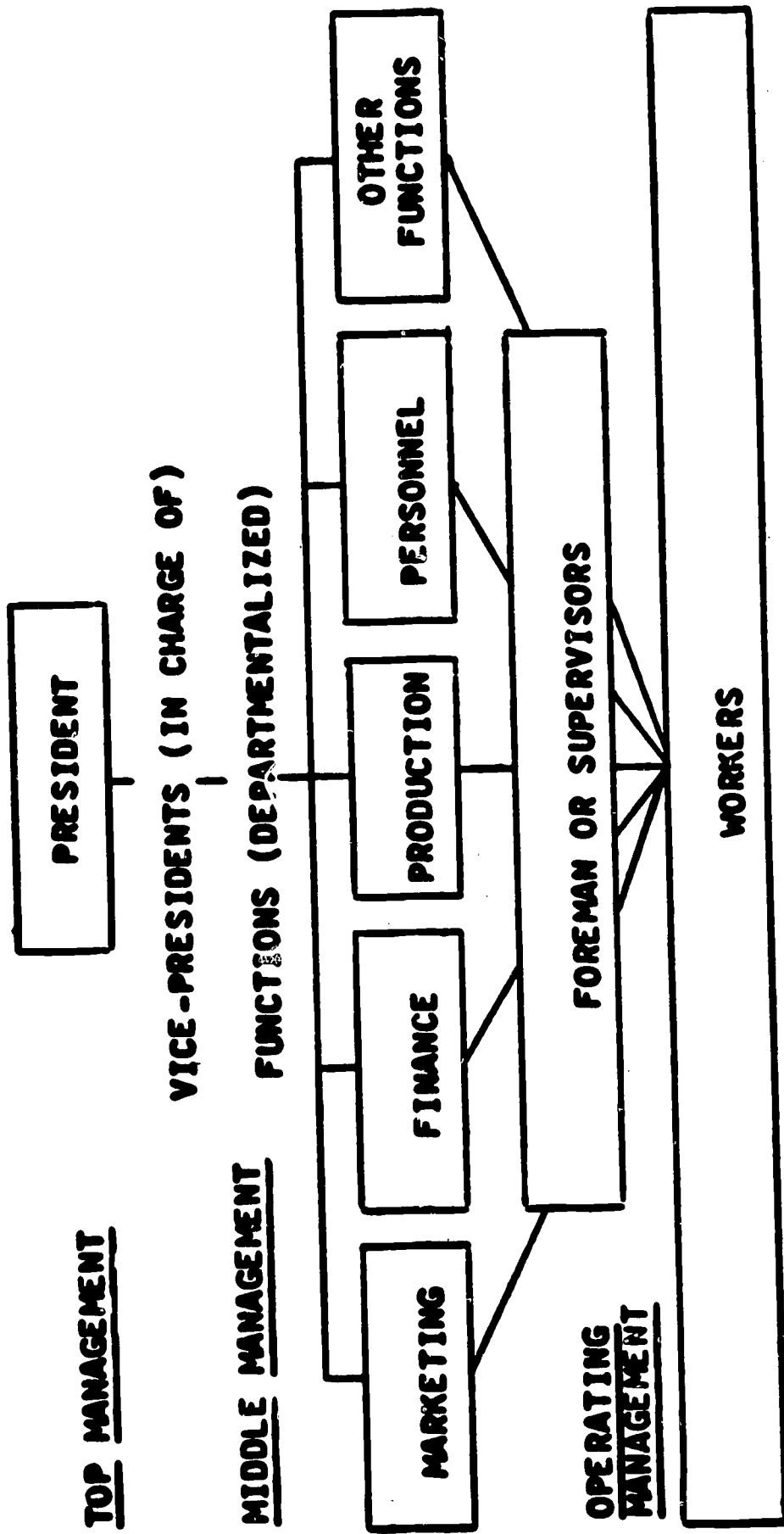
AMRINE AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 55.

MATERIAL ACQUISITION and RECORDING PROCEDURE



Brummet, R. Lee. Cost Accounting for Small Manufacturers. Washington, Small Business Administration, 1953.

LEVELS OF MANAGEMENT



WHEELER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 142.

LEVELS AND FLOW OF AUTHORITY

Ultimate authority
and control

Policy Formation

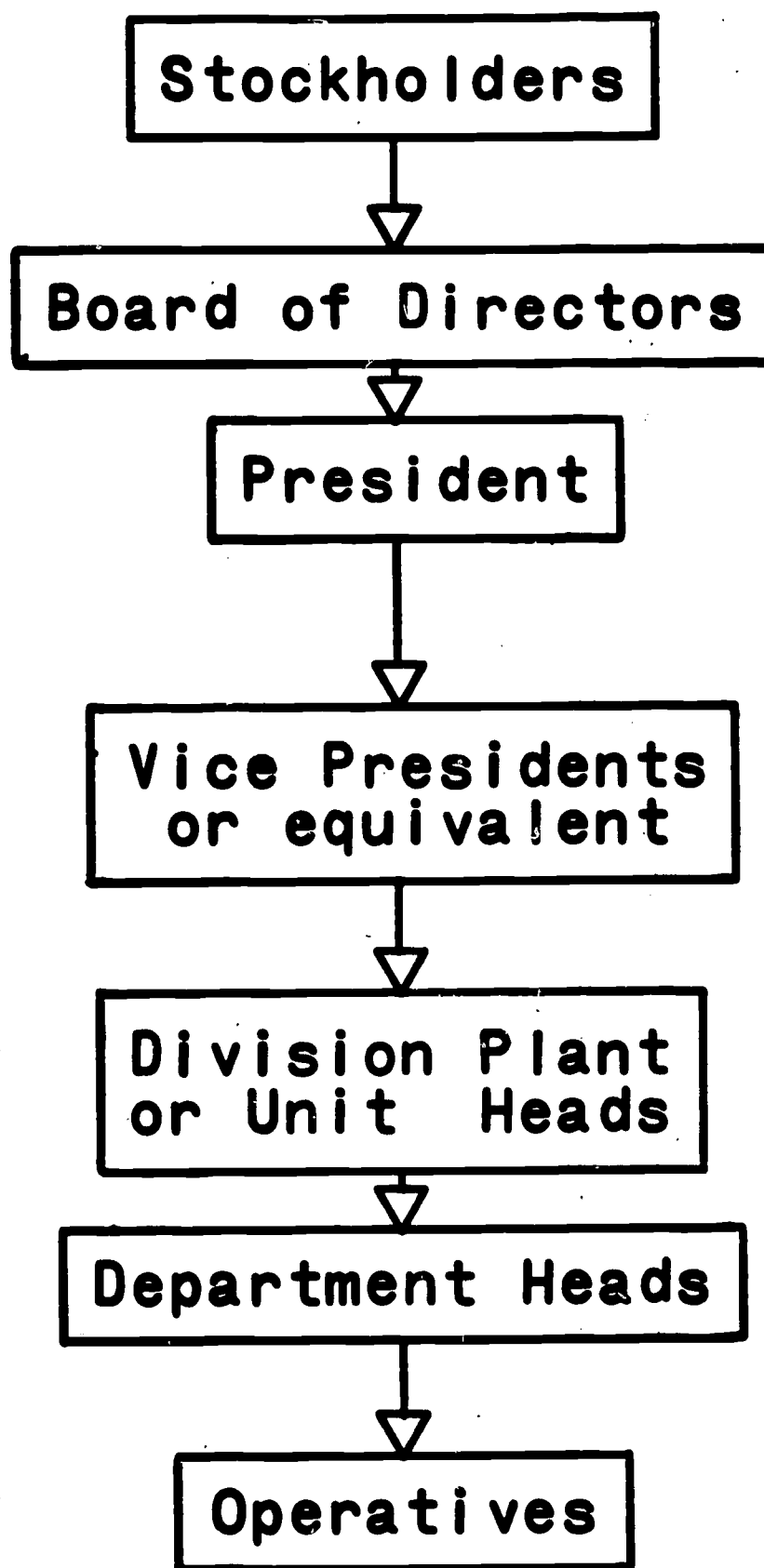
Immediate and effective
authority and
control

Geographic and func-
tional activity
and control

Integration of
operations

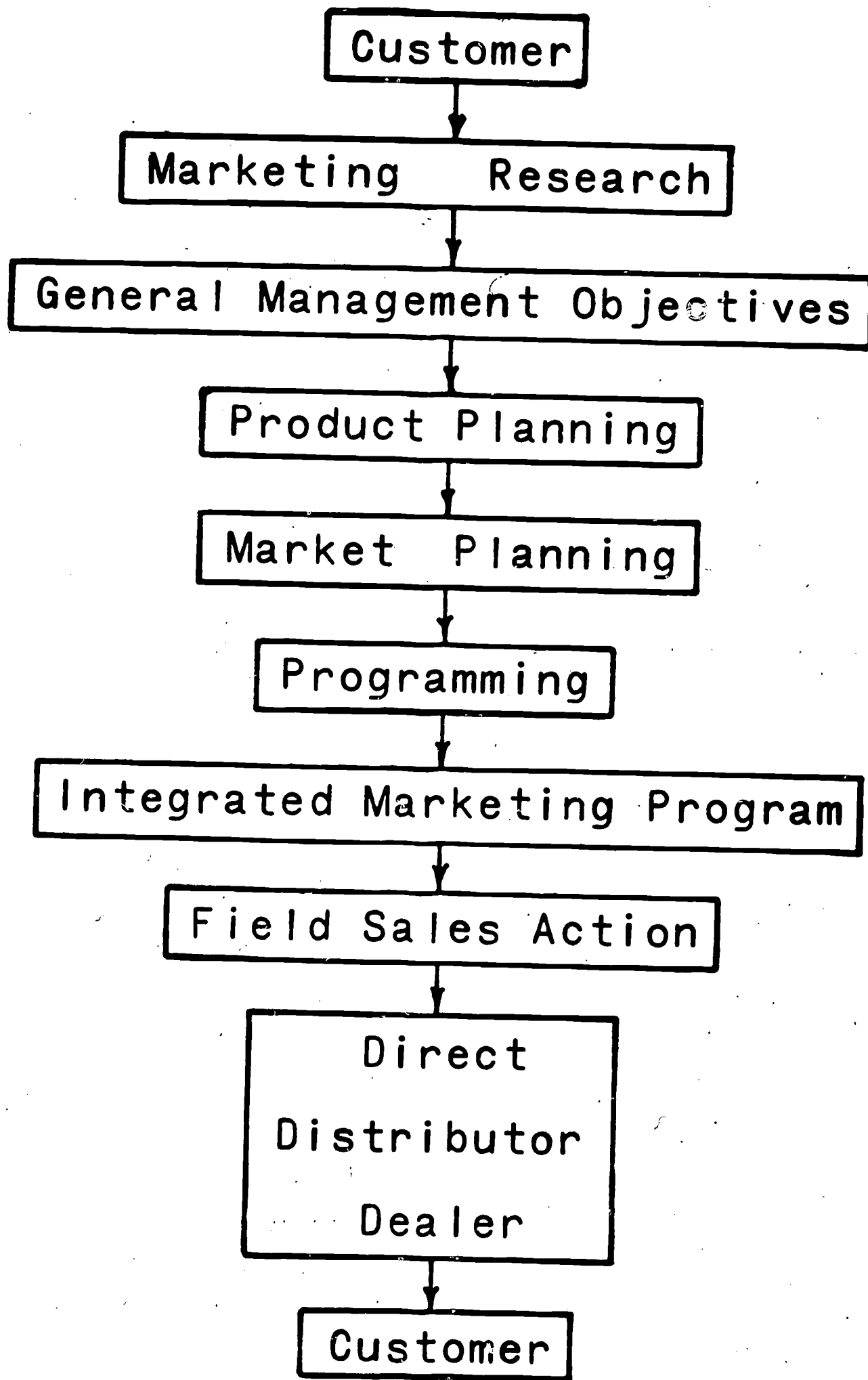
Supervision of
operations

Performance of
operations



WEEKLER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 144.

MARKETING INTER-RELATIONSHIPS



MESSNER, INDUSTRIAL ADVERTISING, P. 31.

TOOLS AND EQUIPMENT:

The manufacture of personal accessories in the general industrial arts laboratory will require the tools and equipment commonly needed for work with woods, metals, plastics and leather.

Special equipment which may be added to provide greater depth is listed below:

1. Small oven (heating and forming plastics)
2. Kiln (copper enameling)
3. Buffing wheel for metals and plastics
4. Carving tools
5. Woodburning tools
6. Molds for plastic casting

2

MATERIALS AND SUPPLIES:

Those materials commonly available in the general industrial arts laboratory are necessary for the manufacture of personal accessories. The following is a suggested list for the development of the unit:

Leather Products

Cow hide, calf skin, lacings, belt buckles, snaps, rivets, key case studs, key case hooks, eyelets, wax and finishes

Plastic Products

Acrylic plastic (variety of colors and thicknesses), casting resin, extruded forms, bead chain, pin backs, tie clasps, cement, dyes, abrasives

Wood Products

V Variety of hard and soft woods, glue, abrasives, metal findings, wood finishes

Metal Products

Sheet copper, aluminum, brass, metal findings, (glaze for enameling), abrasives, finishes

LESSONS TO BE TAUGHT:

The Personal Accessories Industry and its Place in our Society

The Functions of Industry

Market Research and Product Development

Industrial Forms of Design

How to Prepare an Industrial Production Guide

Materials Procurement and Control

Industrial Organization and Management

How to Layout on Flat Stock

How to Cut Flat Stock

How to Shape Flat Stock

How to Form Flat Stock

How to Use Assembly Tools and Materials

Finishing Methods and Tools Used in the Manufacturing of
Personal Accessories

How to Copper Enamel

Packaging Products in the Personal Accessories Industries

Pricing and Marketing Techniques Used in the Personal
Accessories Industry

Title: The Personal Accessories Industry and its Place in our Society

Presentation:

I. Acquaint pupils with personal accessories

A. Display various products

1. Pins (wood)
2. Zipper pulls (plastic)
3. Bracelets (metal)
4. Key cases (leather)

B. Provide research material

C. Make list of various accessories

II. The need for the personal accessories industry

A. Job opportunities

B. Personal adornment

C. Gift giving

III. Scope of the industry

A. Individual ownership

1. Home workshop
2. Small knick-knack shop

B. Partnership

C. Corporation

1. Ownership
2. Mass production

D. Profit-making

IV. Raw materials

A. Wood

1. Walnut
2. Pine
3. Mahogany

B. Metal

1. Copper
2. Aluminum
3. Brass

C. Plastic

1. Acrylic
2. Polyester resin

D. Leather

1. Cowhide
2. Calfhide
3. Sheepskin
4. Deerhide

References:

Joseph F. Luetkemeyer, Jr., A Historical Perspective of Industry, pp. 59-85.

Title: The Functions of Industry

Presentation:

I. Research and development functions

A. Come up with product idea

II. Designing and planning functions

A. Place idea on paper

III. Manufacturing functions

A. Select stock

1. Choose the material

B. Layout

1. Mark on material

C. Cut

1. Ex.: saw, knife

D. Form

1. Mold

2. Model

E. Shape

1. Cut a part of a product

F. Assemble

1. Put together

G. Finish

1. Ex.: paint, shellac, stain, etc.

H. Inspect

1. Look for things that are wrong or incomplete

IV. Distribution functions

A. Package

1. Protect product

B. Ship

1. Ex.: train, truck, plane, etc.

C. Sell

1. Exchange product for money

Reference:

Maine Department of Education, Industrial Arts Technology, p. vi

Title: Market Research and Product Development

Presentation:

I. As a consumer, what qualities do you look for in a TV set?

- A. Price
- B. Quality
- C. Design
- D. Payment method, etc.

II. Show overlays and explain

- A. Marketing inter-relationships
- B. Marketing sub-functions

III. Example of success and failure of market research and advertising

A. Failure

- 1. A pharmaceutical company developed a new pill.
 - a. Water was not needed for swallowing it
 - b. The item was a failure because consumers were used to using water when taking pills

B. Success

- 1. A softdrink manufacturer noticed that sales were low
 - a. Using market research, changes were made in advertising
 - 1) "Refresh without filling" was the slogan
 - 2) New approach changed to the "Sociable Drink"
 - a) Aimed at the young housewife
 - 3) A later approach was directed at young single people
 - 4) Advertisements were made in Life, Post and TV
 - 5) Results made the softdrink one of the leaders in the softdrink industry

IV. In the case of the Hula Hoop

A. Suppose a toy company was given the problem

- 1. An item made of plastic
- 2. Inexpensive to manufacture
- 3. Involving physical activity

V. Coming up with a new product idea (refer to paper product)

A. Ask students how the paper product was developed
(Brainstorming)

1. State problem
2. Divide into small groups
 - a. Develop ideas
3. Decide which is the best product
4. Return to group
5. Decide which product was the best as a group

VI. Put chainlinks on chalkboard and insert "Market Survey"

A. Discuss how all of the links are connected

VII. Discuss product board

A. Take each product and discuss it in terms of:

1. Material
2. Student construction

VIII. Make a copper enameling product (as an attention device only)

IX. Hand out sheet with ideas for products and have students
select one

References:

Lawrence L. Bethel, Industrial Organization and Management, p. 119.

Bayward O. Wheeler, Business: an Introductory Analysis,
pp. 227-229

Title: Industrial Forms of Design

Presentation:

- I. What is design? The process of planning a product
 - A. Tell how design relates to industry and why it is important
 - B. Tell the function of a design engineer
 - C. Ask why it is necessary for a product to have good design
- II. The industrial designing process
 - A. Need
 - B. Research
 1. Materials available
 2. Cost
 3. Tools available
 4. Size limits
 - C. Sketches and drawings
 1. Forms of design
 - a. Geometric
 - b. Free form
 - c. Sculptured
 - d. Streamlined
 - e. Traditional styles
 - D. Experimentation
 1. Scale model
 2. Prototype
 3. Direct result

References:

Arthur Anderson, A Designers Notebook, pp. 36-37.

John L. Feirer, Drawing and Planning for Industrial Arts,
pp. 169-174

Title: How to Prepare an Industrial Production Guide

Presentation:

I. Designing and planning functions

- A. Idea - mind
- B. Rough sketch - looks
- C. Working drawing - size
- D. Bill of materials - cost
- E. Production guide - how to make

II. Fill out production guide heading

- A. Use pencil
- B. Print

III. Make simple rough sketch

- A. Dash method
 - 1. Straight line
 - 2. Curved line
- B. Staple sketch in proper position

IV. Explain working drawing

- A. Drawing that you work with
 - 1. Pattern
 - 2. Carbon transfer
- B. Demonstration in later lesson

V. Explain bill of materials

- A. Size of materials
- B. Cost of materials
- C. Covered in later lesson

VI. Fill out production guide

- A. Use manufacturing functions as guide
- B. Use sample product

Title: Materials Procurement and Control

Presentation:

I. Analyze product for material need

A. Type of material

1. Wood
2. Metal
3. Leather
4. Plastic

B. Class of material

1. Raw material
2. Purchased parts
3. In-process parts
4. Finished products
5. Supplies
6. Equipment

II. Procurement of materials

A. Industrial sources

1. Supply room
2. Supply cabinet
3. Stock room
4. Warehouse
5. Distribution center

B. Means of Procurement

1. Individual
2. Mail order
3. Truck transportation
4. Rail transportation
5. Plane transportation

III. Complete purchase order

A. General information

1. Department
2. Number
3. Date
4. Checks and approvals

B. Bill of materials

1. Quantity
2. Description
3. Units
4. Unit cost
5. Total cost

IV. Receive materials

- A. Check by materials manager
- B. Receive materials from stock men

References:

Lawrence Bethel, Industrial Organization and Management,
pp. 263-283

Title: Industrial Organization and Management

Presentation:

I. Industrial organization forms

A. Individual proprietorships and partnerships

1. Small industries, little capital, easily controlled
2. Manager acquires buildings, capital, machinery and labor

B. Corporation

1. Most industries are organized this way
2. Composed of stock or share-holders who own company
3. Board of Directors to fix policies and manage company

II. Personnel organization

A. Simple line organization

1. Simplest form for small companies
2. Direct line responsibilities
3. Similar to military organization
4. Each member responsible to supervisor, manager or foreman

B. Line and staff

1. For more complex organizations of larger size
2. Consists of supervisors and foremen with supervisory control and assistants and specialists or advisors to help them

C. Line staff and committee

1. Provides further breakdown for larger organizations
2. Committees formed for special work and may not be permanent

III. Industrial arts laboratory organization

A. Consists of line organization form

B. Provides responsibilities for all personnel

C. Involves and encourages "teamwork" in accomplishment of tasks

D. Functions as a laboratory use and care organization.

E. Positions may be elected or appointed

References:

Lawrence L. Bethel, Industrial Organization and Management, pp. 32-52.

Title: How to Layout on Flat Stock

Presentation:

- I. Select wood and layout product
 - A. Demonstrate the tri-square and pencil
 1. Draw right angle
 2. Check for squareness
 - B. Demonstrate the rule
 1. Measure length and mark for squaring
 2. Use rule on edge
 - C. Demonstrate use of carbon paper
 1. Transfer outline to wood
- II. Select plastic and layout product
 - A. Relate to wood layout
 1. Discussion
 - B. Demonstrate the compass
 1. Circles and arcs
 2. Tangent
- III. Select metal and layout product
 - A. Relate to wood layout
 - B. Demonstrate the scribe
 - C. Demonstrate the combination square
 - D. Demonstrate the dividers
- IV. Select leather and layout product
 - A. Discuss possible layout tools
 - B. Prepare cardboard pattern and trace

References:

John L. Feirer, Industrial Arts Bench Woodwork, pp. 34-38.

Roland R. Fraser and Earl L. Bedell, General Metal,
pp. 17-22.

Title: How to Cut Flat Stock

Presentation:

I. Backsaw

A. Characteristics

1. Fine teeth
2. Stiff back
3. Advantages
4. Disadvantages

B. Demonstrate proper use

II. Coping saw

A. Characteristics

1. Flexible blade
 - a. Sharp corners
 - b. Curves
2. Replaceable blade

B. Demonstrate proper and safe use on wood and plastic

III. Hand drill

A. Characteristics

1. Demonstrate placement of drill in chuck
2. Drill 5/32" hole in plastic and wood
3. Have students drill one hole also

IV. Shears

A. Aviation snips

1. Demonstrate proper use on copper

B. Scissors

1. Demonstrate proper use on leather

V. Leather punches

A. Rotary

1. Demonstrate proper procedure for cutting
2. Demonstrate selection of various size hole selection

B. Lacing punch (thonging punch)

1. Place marking line on leather
2. Demonstrate technique
 - a. Place board under leather to prevent cutting bench

References:

Lavon B. Smith and Marion E. Maddox, Elements of American Industry, pp. 83-87, 31-32, 163.

Title: How to Shape Flat Stock

Presentation:

I. Sheet abrasives

A. Describe abrasives

1. Define: a tool with thousands of tiny cutting edges
2. Describe structure (transparency)
3. Demonstrate size and cut of grit
 - a. Fine - small scratches
 - b. Medium - larger scratches
 - c. Coarse - largest scratches
4. Describe order of use
 - a. Start with coarse
 - b. Work to fine
5. Describe proper abrasive for each material
 - a. Wood
 - 1) Garnet
 - 2) Aluminum
 - b. Metal and plastic
 - 1) Silicon carbide
 - 2) Crocus

B. Demonstrate use

1. Hold stock
 - a. Hand
 - b. Vise
2. Prepare abrasive sheet
 - a. Pad
 - b. Strip
3. Cut stock
 - a. Wood - with grain
 - b. Metal and plastic - in one direction

II. Files

A. Describe file

1. Describe structure
 - a. One solid piece of metal
 - b. Individual cutting edges
 - c. A different number of teeth
2. Describe order of use
 - a. Start with coarse
 - b. Work to fine
3. Select correct file
 - a. Pick shape to fit surface being cut
 - b. Ex.: Half-round for concave, flat for convex

B. Demonstrate use

1. Hold stock
 - a. Hand
 - b. Vise
2. Hold file correctly
 - a. Handle in right hand
 - b. Tip of file with thumb and first finger of left hand
3. Cut
 - a. Cut on forward stroke
 - b. Lift up on back stroke

References:

Oswald A. Ludwig, Metalwork Technology and Practice, pp. 96, 334.

Title: How to Form Flat Stock

Presentation:

I. Metal forming

A. Hand forming

1. Pliers
2. Vise
3. Bending jig
4. Hammer and sand bag (raising)
5. Hammer and form (beating down)

B. Machine forming

1. Brake
2. Slip roll

II. Plastics forming

A. Casting

1. Types of forms and molds
2. Mixing of catalyst and resin
3. Coloring
4. Pouring
5. Hardening
6. Embedding

B. Bending

1. Acrylic thermoplastic
 - a. Colors
 - b. Types
2. Heating of acrylic
3. Methods of forming
 - a. Molds (compression molding)
 - b. Forming by hand

References:

American Handicrafts Company, Catalog, pp. 1-4

Roland R. Fraser, General Metals, pp. 49-60

C. Vernon Siegner, Art Metalwork, pp. 40-42

Title: How to Use Assembly Tools and Materials

Presentation:

I. Prepare stock

A. Wood

1. Smooth
2. Free of dust and dirt

B. Plastic

1. Remove protective paper
2. Clean with alcohol

II. Select proper adhesives

A. White resin glue

B. Ethylene di-chloride

C. Rubber cement

III. Apply adhesives

A. Wood

1. Apply white glue to both contact surfaces
2. Be sure surfaces are completely coated

B. Plastic

1. Apply ethylene di-chloride to both contact surfaces
2. Use eye dropper for easy application

C. Leather

1. Apply rubber cement to both contact surfaces
2. Set until dry

IV. Clamp stock

A. Wood

1. Hand screw clamp
2. Even pressure

B. Plastic

1. Hand
2. Even pressure

C. Leather

1. Press surfaces together

References:

Raymond Cherry, General Plastics, pp. 34-36

John L. Feirer, Industrial Arts Bench Woodwork, pp. 125-130

Title: Finishing Methods and Tools Used in the Manufacture of
Personal Accessories

Presentation:

I. Preparation of articles for finishing

A. Why does a product need a finish?

1. Beauty, color
2. Protection
3. Wearing qualities
4. Texture

B. Getting ready to apply a finish

1. Smoothing with abrasive
 - a. Wood - garnet abrasive paper
 - b. Metal - emery, silicon carbide or steel wool
 - c. Leather - edge creaser
 - d. Plastic - silicon carbide, buffing compound
2. Cleaning
 - a. Steel wool
 - b. Alcohol
 - c. Oxalic acid

II. Finishing a product

- A. Buffing
- B. Copper enameling
- C. Oil finish
- D. Lacquer spray or brushing
- E. Planishing

References:

Lavon B. Smith, Marion E. Maddox, Elements of American Industry, pp. 56-64, 105-112, 162

Title: How to Copper Enamel

Presentation:

- I. The term "enameling" means the process of applying a thin coat of glass onto a metal
 - A. When heated to a high temperature, the glass melts and fuses to the metal
- II. The first operation is to clean the metal
 - A. Use emery paper or cloth
 - B. Steel wool
- III. Agar is a liquid which is swabbed or brushed on next
 - A. It is an adhesive solution
- IV. The colored glass is then dusted on the metal
- V. Glass chunks and threads are then added to the metal
- VI. Place in the kiln and heat until glass flows
- VII. Remove from kiln and allow to cool
- VIII. If deeper colors are desired:
 - A. Repeat step IV
 - B. Reheat the metal

References:

American Handicrafts Company, Instructor's Manual, p. 40

Title: Packaging Products in the Personal Accessories Industry

Presentation:

I. Packaging in industry

A. History of packaging

1. Wood, cloth and skins were used in early times to transport
2. Glass bottles revolutionized packaging in 1700's
3. Package industry amount to 12 billion dollars annually at present

B. Need for packaging

1. Protection of goods
2. Advertisement of the product
3. Give product eye appeal

C. Kinds of packages

1. Boxes
2. Plastic
3. Cards
4. Can, bottles
5. Bags, sacks

II. Packaging a product in the Industrial Arts laboratory

A. Design a package

B. Make it

C. Package the product

References:

Donald E. Cooke, Marvels of American Industry, pp. 265-266

Title: Pricing and Marketing Techniques Used in the Personal
Accessories Industry

Presentation:

I. Single ownership

A. Manufactures products

B. Advertise

1. Newspaper
2. Local radio station

C. Sell merchandise

1. Determining price to charge
 - a. Basic material \$.12
 - b. Direct cost .39
 1. Labor
 - c. Indirect expense .17
 1. Heat
 2. Lights
 3. Rent
 - d. Profit (50% of cost) .34
- \$1.02

D. Sell to store in town

E. Sell to small chain of stores

II. Corporation

A. Market research

1. Customer demand

B. Research engineering

1. Product improvement

C. Production

1. Number of units to be produced

D. Sales

1. Number of units to be sold

E. Dealer

1. Determine customer needs

F. Customer

1. Eventual consumer

III. Conclusion

- A. Whether business is large or small, basic marketing procedures of pricing and marketing do not change

References:

Lawrence L. Bethel, Industrial Organization and Management, p. 119.

Robert W. Haus, Manufacturing in the School Shop, pp. 42-44.

GROUP DISCUSSION ON CONCEPTS OF INDUSTRIAL ARTS

Directions: As a group, think about each question carefully and then write down the answer that the group decides on.

1. What do industries do for us?
2. If you had a job in industry, what would be expected of you as a worker?
3. What are some of the functions of an industry?
4. What do you think is the purpose of Industrial Arts?

9. When gluing two pieces of wood together, glue should be applied
- to one surface
 - to both surfaces
 - very heavily
 - only around the outside edges
10. Industries have their workers assigned to certain jobs for more successful production. This is called:
- product planning
 - engineering
 - personnel organization
 - worker organization
11. In industry, a person who guides, directs and assists workers under him is called a:
- foreman
 - supervisor
 - manager
 - chairman
 - all of these
 - none of these
12. The industrial arts laboratory organization of workers:
- makes everyone responsible for a job.
 - allows some people freedom to do as they please.
 - helps to make better products.
 - gives everyone a chance to be "boss."
13. The process of enameling on copper refers to which process?
- cutting
 - forming
 - shaping
 - finishing
14. The material to be placed on the copper to be melted is:
- paint
 - glass
 - plating solution
 - solder
15. The liquid placed on the clean copper to prepare for enameling is:
- a dye
 - a colored material
 - an adhesive solution
 - copper sulphate
16. "Brainstorming" is a process where:
- one person works on a problem
 - an answer to a problem is decided by top management
 - a group of persons work out a solution to a problem
 - a problem exists but no answer is available

17. A market survey is used to:
- a. decide how a product should be produced
 - b. save money in production of the item
 - c. determine customers' desires
 - d. sell stock in the corporation
18. In industry, direct expenses would include:
- a. labor
 - b. overhead
 - c. dividends
 - d. bad debts
19. In industry, indirect expenses would include:
- a. labor
 - b. overhead
 - c. basic materials
 - d. raw materials
20. The unusual part of a backsaw is:
- a. the length
 - b. fine teeth
 - c. rigid back
 - d. the handle
21. The coping saw is used to cut:
- a. wood and plastic
 - b. metal
 - c. leather
 - d. cast iron

Part II. Directions: Complete the following sentences with as many words as you need.

1. Name two tools used for drawing circles and arcs.

2. Name two tools used for laying out square corners.

3. Name two hobbies in which you might make products, classified as personal accessories.

4. List four materials used in the personal accessories industry and a product made from each.

5. Give two reasons why society has a need for the personal accessories industry.

6. Give two reasons why a product needs a finish.

7. Give two reasons why a product is put in a package.

8. Complete a sample purchase requisition as explained below.

Product: a plastic key tag. Material: three pieces of plastic made from red, yellow and green, each two inches square. Cost: 1¢ per square inch.

QUANTITY	SIZE, COLOR, MATERIAL	UNITS	TOTAL COST

Part III. Directions: Match the statement at the left with the word or words at the right and write the letter on the line.

- A. _____ 1. A raw material
 _____ 2. A finish
 _____ 3. A purchased part
 _____ 4. A piece of equipment
 _____ 5. A hand tool
- a. water
 b. files
 c. linseed oil
 d. bead chain
 e. leather
 f. buffer
- B. _____ 1. Material selection
 _____ 2. Layout
 _____ 3. Cut
 _____ 4. Form
 _____ 5. Shape
 _____ 6. Assemble
 _____ 7. Finish
 _____ 8. Inspect
- a. sawing materials
 b. checking for things wrong
 c. painting the product
 d. marking on material
 e. taking material from stock
 f. gluing material together
 g. filing rough edges of material
 h. bending hot plastic
- C. _____ 1. Idea
 _____ 2. Rough sketch
 _____ 3. Working drawing
 _____ 4. Purchase requisition
 _____ 5. Industrial production guide
- a. cost of materials
 b. what the product will look like
 c. how to make the product
 d. a picture formed in the mind
 e. size of the product

How would you form the following personal accessories?
Choose the best method.

- | | | | |
|----|--------------------------|--------------------------|------------------------|
| C. | <input type="checkbox"/> | 1. copper tray | a. casting |
| | <input type="checkbox"/> | 2. plastic bowl | b. box and pan brake |
| | <input type="checkbox"/> | 3. metal bracelet | c. hammer and sand bag |
| | <input type="checkbox"/> | 4. copper tie pin | d. slip roll |
| | <input type="checkbox"/> | 5. embedded coin key tag | e. heating in an oven |
| | <input type="checkbox"/> | 6. snake ring | f. sheetmetal stake |
| | | | g. by hand |

UNIT EVALUATION

PERSONAL ACCESSORIES

ANSWER SHEET

Part I.

1. C
2. A
3. B
4. D
5. D
6. C
7. B
8. D
9. B
10. C
11. E
12. A
13. D
14. B
15. C
16. C
17. C
18. A
19. B
20. C
21. A

Part II.

1. Company, divider
2. combination square, tri-square
3. leather, copper enameling
4. leather, key case
wood, earrings
metal, pin
plastic, zipper pull
5. provide products to purchase;
provide jobs for people
6. for protection;
adds to appearance
7. to protect;
to beautify
8. quantity 1 (each)
size - color - material
2 x 2 red plastic
2 x 2 yellow "
2 x 2 green "

Units: 4 square inches (each)
Total cost: 4¢ (each)

Part III.

- A. 1. A
2. C
3. D
4. F
5. B

- B. 1. E
2. D
3. A
4. H
5. G
6. F
7. C
8. B

- C. 1. D
2. B
3. E
4. A
5. C

- D. 1. C
2. E
3. D
4. B
5. A
6. F

TITLE OF UNIT

INTRODUCTION TO INDUSTRIAL ARTS AND TECHNOLOGY

TEACHING TEAM

JOHN SWANSON
AUBREY KNOWLEN
RICHARD DEAN
WILLIAM FINDLEN
KENNETH OLSON

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

We are living in an age when industry and technology are having an ever-increasing effect on the lives of each individual. Society has accepted and even demanded many of the technological changes and advances because of the benefits of improved living conditions. Concurrently, however, there has developed a greater need for understanding of the technology in order to better prepare for, adjust to, and cope with the many problems resulting from these changes.

Industrial arts can make a unique contribution to early school leavers and to the college-bound youngster; to those of both low and high scholastic ability; for the future industrial worker and for future professionals; and for those at all levels of the economic spectrum. All members of society must learn to be aware of and to live effectively in today's technological culture.

This unit is designed to interest and orient the junior high pupil to the industrial arts program as it relates to the general school program and society. It is a guide to introduce the pupil to technology and the order and structure necessary in modern industry.

SCOPE:

This unit is intended for junior high students (7th, 8th, 9th) who have had no previous experience with industrial arts and technology. The time allotted need not be more than 160 minutes. The class should not exceed twenty students that are heterogeneously grouped.

This unit will cover administrative details that pertain to the industrial arts laboratory and will attempt to associate industrial arts with industry and technology.

OBJECTIVE 1: To develop an understanding of the meaning and purpose of industrial arts and its relationship to industry and technology

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Relate how industrial arts fits into their education. 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. View film: "The Factory" 2. Discuss the film. 	<p>Orientation to Industry, Society and Technology</p>

OBJECTIVE 2: To develop a desirable attitude toward the organization
and operation of the industrial arts program

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Enter, participate and depart in an orderly fashion. 2. Recognize the need for administrative detail in industrial situations 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. Discuss and negotiate a contract. 2. Review and discuss the floor plan. 3. Tour the lab. 4. Make name tags. 	<p>Administration of an Industrial Arts Laboratory</p>

APPROACH:

This unit is introduced by:

- A. Viewing and discussing a film to orient the student to industry and mass production.
- B. Touring the laboratory facilities.
- C. Using a contract for organization and behavior in the laboratory.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T., Manufacturing Organization and Management, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1966. Chap. 3.

Bittel, Lester R., What Every Supervisor Should Know, New York: McGraw-Hill Publishing Co., 1959. Chap. 13.

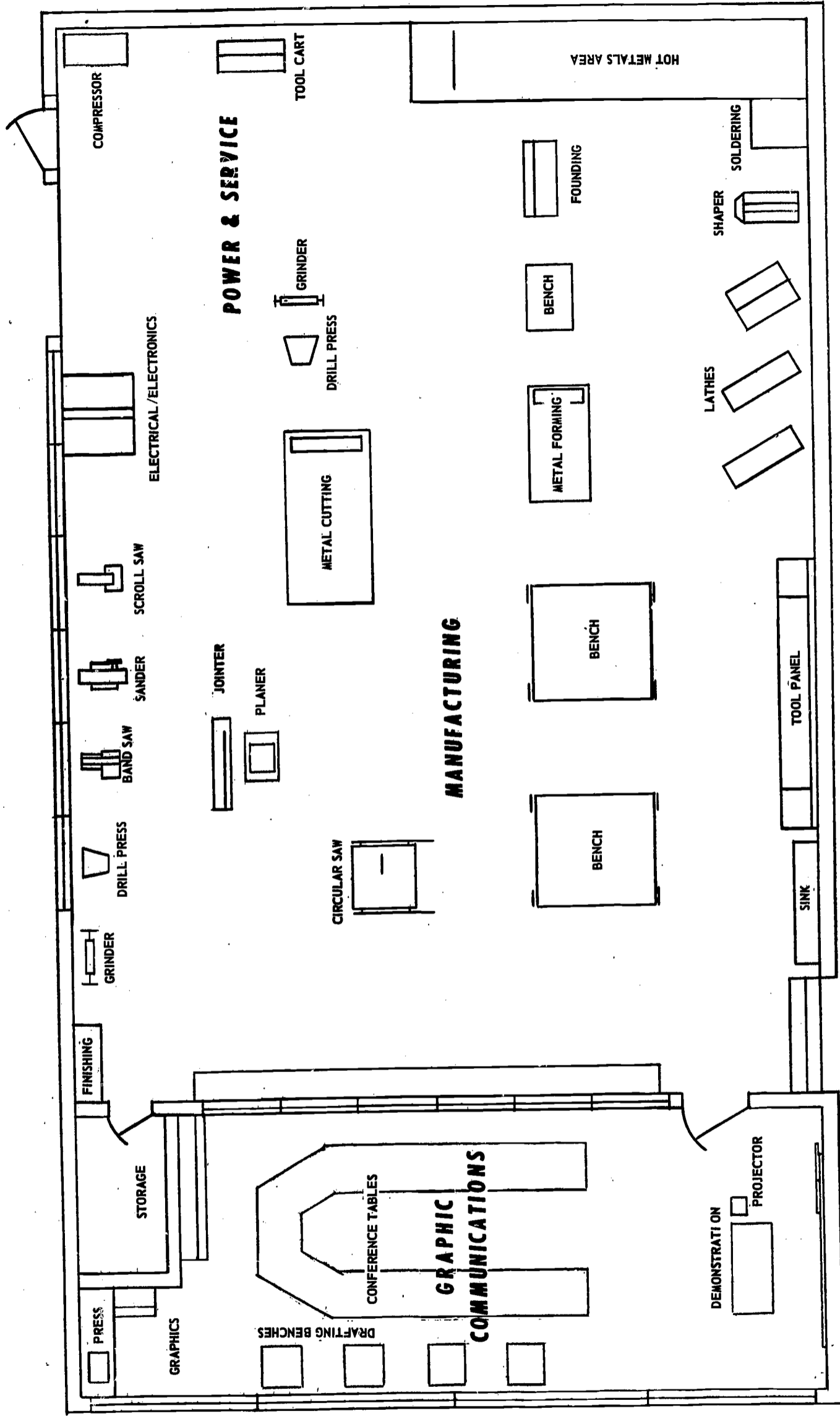
Olson, Delmar W., Industrial Arts for the General Shop, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1965. Chap. 1.

Olson, Delmar W., Industrial Arts and Technology, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963. Chap. 3 and 4.

RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Floor plans with overhead transparency of same
2. Film: The Factory. How a Product is Made., #11684 - University of Michigan Audio Visual Education Center, 720 E. Huron Street, Ann Arbor, Michigan. Cost: \$6.50
3. Contract covering administrative details for procedure and behavior in the laboratory. (Overhead transparency of contract as well as two copies of the contract for each student - student copy and management copy.)



LABORATORY OF INDUSTRIES

GORHAM STATE COLLEGE

THE CONTRACT:

A dictionary defines a contract as a written agreement between two or more parties. It is the written evidence of such an agreement. (In our industrial society, there is much need for contracts between manufacturers and buyers, between companies and their employees, between stores and consumers, etc.) With the use of these contracts, it is much easier for all parties to remember the terms of agreements that they have made in the past.

Just as any large corporation or business needs rules and regulations to carry on their work in an efficient way, industrial arts laboratories need them also so that we may get the job done with the least amount of confusion. We will use a contract between you, the student, and the instructors, the management, in this industrial arts laboratory. This contract will be an agreement between two parties as to the rules and regulations necessary for the orderly procedures in this class.

CONTRACT

I, _____ being a duly qualified student at Gorham State College Laboratory of Industries, do agree to the following rules and regulations as being necessary to orderly procedure to be followed during the time period that I am working in the Laboratory of Industries:

Rules:

1. All students will report for work at 11:00 a.m., E.D.T., from July 15, 1968 to August 2, 1968 in the classroom of the Laboratory of Industries, Room 200A - Gorham State College, Industrial Education and Technology Center. They will be seated quietly waiting for the day's assignment.
2. All students will have the following equipment with them at all times:
 - a. pencil
 - b. notebook
 - c. apron (will be provided)
3. All students will follow all safety rules and use all safety devices outlined and prescribed during the course.
4. All students will do the assigned work to the best of their ability.

I, _____, have read this contract, understand the terms of this contract, and will follow, to the best of my ability, the items contained in it.

Date _____ Signed _____

Acceptance for staff of the Laboratory of Industries by _____

Signed _____ Date _____

TOOLS AND EQUIPMENT:

Those found in the typical industrial arts laboratory,
including:

1. Sixteen mm. sound projector with screen
2. Felt tip pens
3. Overhead projector

MATERIALS AND SUPPLIES:

1. Name tag material
2. Folders

LESSONS TO BE TAUGHT:

Orientation to Industry, Society and Technology

Administration of an Industrial Arts Laboratory

Title: Orientation to Industry, Society, and Technology

Presentation:

- I. Introduction to course and relate to film
 - A. The corporation setup
 - B. The manufacture by mass production of a product
- II. Introduce the film
 - A. Many people working together
 - B. The planning, preparation, and work involved in mass production
- III. Outline the procedure followed by the planning board for a new idea
 - A. Idea is formulated
 - B. Rough sketches are made
 - C. Experimental department makes a model
 - D. Planning board approves
- IV. Engineering and tooling department
 - A. Decide on tools and materials needed
 - B. Tools and blueprints are made
- V. Purchasing department
 - A. Order materials
- VI. Personnel department
 - A. Interviewing hired help
- VII. Receiving department
 - A. Receive materials
- VIII. Production line and manufacture of product
 - A. Setup of line
 - B. Automatic machines

Title: Orientation to Industry, Society and Technology (continued)

C. Mass production of parts

D. Assembly line procedures

E. Tests of working parts

IX. Order followed after manufacture of product

A. Packaging

B. Sales

C. Shipping

D. Retail

E. Consumer

References:

Film: The Factory. How a Product is Made.

Title: Administration of the Industrial Arts Laboratory

Presentation:

I. The floor plan

- A. Architectural drawing
- B. Machines in logical order
- C. Block plan
- D. Planning product flow

II. The contract

- A. An agreement
- B. When used
- C. A set of rules to be followed
- D. Legal aspects
- E. Negotiation of a contract

References:

Bittel, Lester R., What Every Supervisor Should Know, Chap. 13

UNIT EVALUATION:

Evaluation of this unit will be by observation of the students' ability to function properly in the industrial arts laboratory setting and whether or not he seems to have an idea of the relationship of industrial arts to school and society.

TITLE OF UNIT

INTRODUCTION TO MANUFACTURING
THROUGH THE STUDY OF
THE CAMPING EQUIPMENT INDUSTRIES

TEACHING TEAM

JOHN SWANSON
AUBREY KNOWLEN
RICHARD DEAN
WILLIAM FINDLEN
KENNETH OLSON

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY FOR INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College
Gorham, Maine

July 1 - August 9, 1968

INTRODUCTION:

Our great American society is built on our ability to develop and improve our industrial, technical facilities. Nations and cultures who fail to do this soon fall by the wayside.

Many changes in the composition of our world society have occurred in recent years. There has been rapid economic expansion, stable employment, rapid rise in population, industrialization of backward nations, and a general world-wide demand for a higher standard of living. One need only to pick up a daily newspaper to have these facts brought home.

The study of, and involvement in, our industrial society is not only an extremely exciting and rewarding experience for the youth of today, it is also a necessity for him if he is to take his place in this world society so that he may become a valuable asset to the continued improvement of our national heritage. Through the varied activities of this unit, he should find a place where he can develop, expand, and test his individual talents.

JUSTIFICATION FOR STUDYING CAMPING EQUIPMENT INDUSTRIES:

With the advancement of technology in our culture, the average American suddenly finds himself with more and more leisure time on his hands. He also has more money to spend on consumer goods, thus raising his standard of living.

In the search for a profitable use of this leisure time, many Americans have turned to camping in the great outdoors of the world. As a result, the camping equipment industries have had a great increase in the demand for its products.

Pupils should have a great deal of interest in camping equipment because of their natural interest in the lure of the great outdoors. Because of this interest, they should be highly motivated to study the total manufacturing activities that are associated with the development of camping equipment.

SCOPE:

This unit is designed for seventh or eighth grade pupils having no previous industrial arts laboratory experience. It is intended to accommodate up to twenty pupils and to cover an approximate time schedule of 960 minutes, or twenty four 40 minute periods.

The pupils involved are of average abilities and heterogeneously grouped.

In this unit, the pupils will be introduced to the organization and structure of a corporation involved in the mass production of goods. It is expected that they will gain only the basic tool skills necessary to develop and produce a simple product by mass production. The major emphasis of this unit shall be on a basic understanding of the functions of the various elements of the corporate mass production industries. The activities carried on will be mainly motivational, so that the pupil will enter into progressive units eager to acquire and develop, to a greater degree, the knowledge and skills gained in this unit.

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Recognize the structure of a manufacturing organization 2. Explain the function of the marketing division of a manufacturing industry (sales, advertising, service, market research, distribution) 3. Explain the functions of the finance division of a manufacturing industry (stocks, bonds, budgeting, paying and receiving) 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. Study line and staff organization 2. a. Study worksheet on marketing <ol style="list-style-type: none"> b. Do a problem in one of the areas of marketing <ol style="list-style-type: none"> 1) Develop advertising poster 2) Develop package for the product 3) Develop a TV commercial to sell the product 4) Develop singing commercial 3. a. Study a worksheet of financing an industry <ol style="list-style-type: none"> b. Fill out a time sheet and compute a payroll 	<p>Line and Staff Organization in a Corporate Manufacturing Industry</p> <p>Functions and Activities of the Marketing Division of a Corporate Manufacturing Industry</p> <p>Functions and Activities of the Finance Division of a Corporate Manufacturing Industry</p>

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>4. Explain the function of the engineering division of a manufacturing industry (product design, quality control, tooling methods, plant maintenance, safety, work schedule)</p>	<p>Have pupils:</p> <p>3. c. Examine financial page of a news-paper</p> <p>d. Do a problem with stocks</p> <p>4. a. Examine working drawings</p> <p>b. Develop a product flow chart</p> <p>c. Inspect and criticize their own work for quality</p> <p>d. Suggest improvement of tool, jig, and fixture design</p> <p>e. Develop simple jigs and fixtures</p> <p>f. Develop a plant maintenance and safety procedure</p>	<p>Functions and Activities of the Engineering Division of a Corporate Manufacturing Industry</p>

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>5. Explain the function of the personnel division of a manufacturing industry (employment, employee relations, training)</p>	<p>Have pupils:</p> <p>4. g. Suggest and develop new products for manufacturing</p> <p>h. Make sketches for new products, jigs and fixtures</p> <p>i. View film "According to Plan," McGraw-Hill</p> <p>j. Examine drawing instruments and equipment</p> <p>5. a. Examine want ads</p> <p>b. Apply for job (fill out a job application)</p> <p>c. Job interviews with self-criticism</p> <p>d. Receive training for a specific job</p> <p>e. Develop and organize a union</p>	<p>Basic Elements of Engineering Drawing</p>
<p>5. Explain the function of the personnel division of a manufacturing industry (employment, employee relations, training)</p>		<p>Functions and Activities of the Personnel Division of a Corporate Manufacturing Industry</p>
		<p>Development, Organization and Function of Unions</p>

OBJECTIVE 1: To develop an understanding of the manufacturing industries and the role they play in our society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>6. Explain the function of the production division of a manufacturing industry (purchasing, production planning, manufacturing)</p>	<p>Have pupils:</p> <p>6. a. Develop production flow chart for a product</p> <p>b. Develop bill of material for a product</p> <p>c. Make a product</p> <p>d. Package a product</p> <p>e. Develop a product schedule</p>	<p>Functions and Activities of the Production Division of a Corporate Manufacturing Industry</p>

OBJECTIVE 2: Discover and develop a degree of skill in the elements of
the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Recognize the main manufacturing processes from layout to finish 2. Recognize and use layout tools and procedures 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. View specific jobs in the manufacture of a product 2. <ol style="list-style-type: none"> a. Locate and name the layout tools he will use b. Demonstrate safe use of layout tools he will use c. Use simple layout tools in the manufacture of a product 	<p>Overview of the Manufacturing Processes</p> <p>Common Layout Processes</p> <ol style="list-style-type: none"> a. Hand Layout b. Patterns c. Templates d. Measurement e. Terminology
<ol style="list-style-type: none"> 3. Recognize and use cutting tools and procedures 	<ol style="list-style-type: none"> 3. <ol style="list-style-type: none"> a. Locate and name the cutting tools and machines he will use in the manufacture of a product b. Demonstrate safe use of each machine and tool used for cutting c. Use proper cutting tool in the manufacture of a product 	<p>Common Cutting Processes</p> <ol style="list-style-type: none"> a. Hand Cutting b. Sawing c. Abrasives d. Filing e. Shearing f. Drilling

OBJECTIVE 2: Discover and develop a degree of skill in the elements of
the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>4. Recognize and use forming and shaping tools and procedures</p>	<p>Have pupils:</p> <p>4. a. Locate and name the forming and shaping tools he will use</p> <p>b. Demonstrate safe use of each machine and tool used for forming and shaping</p> <p>c. Use forming and shaping tools in the manufacture of a product</p>	<p>Common Forming and Shaping Processes</p> <p>a. Bending</p> <p>b. Stamping</p>
<p>5. Recognize and use holding tool and procedures</p>	<p>5. a. Locate and name the holding tools and machines he will use in the manufacture of a product</p> <p>b. Demonstrate safe use of each tool used for holding</p> <p>c. Use holding tools in the manufacture of a product</p>	<p>Common Holding Processes</p> <p>a. Jigs and Fixtures</p> <p>b. Clamping and Holding Devices</p>

OBJECTIVE 2: Discover and develop a degree of skill in the elements of the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>6. Recognize and use assembly tools and procedures</p>	<p>Have pupils:</p> <p>6. a. Locate and name the assembly tools he will use in the manufacture of a product</p> <p>b. Demonstrate safe use of each machine and tool used for assembly</p> <p>c. Use assembly tools in the manufacture of a product</p>	<p>Common Assembly Techniques</p> <p>a. Riveting, Pop</p> <p>b. Riveting, Peened</p> <p>c. Force Fit</p>
<p>7. Recognize and use finishing tools and procedures</p>	<p>7. a. Locate and name the finishing tools and procedures he will use in the manufacture of a product</p> <p>b. Demonstrate safe use of each tool used for finishing</p> <p>c. Use finishing tools in the manufacture of a product</p> <p>d. Use finishes on the product he is to manufacture</p>	<p>Common Finishing Techniques</p> <p>a. Polishing</p> <p>b. Sanding</p> <p>c. Dip Finish</p>

OBJECTIVE 2: Discover and develop a degree of skill in the elements of
the manufacturing industries

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>8. Care for tools, equipment and facilities</p>	<p>Have pupils:</p> <p>8. a. Return tools to panels as soon as possible after use</p> <p>b. Demonstrate simple maintenance procedures on tools, machines, and equipment; eg. oil, wipe, polish, clean, etc.</p> <p>c. Participate in clean-up operations in the laboratory</p>	<p>Maintenance Procedures</p> <p>a. Principles</p> <p>b. Organization</p>

OBJECTIVE 3: To develop desirable attitudes about his place in an industrial, technical society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 1. Demonstrate safe work habits through his actions 2. Work cooperatively and show respect toward management and fellow workers 	<p>Have pupils:</p> <ol style="list-style-type: none"> 1. a. See and discuss safety film b. Prepare a safety bulletin for fellow students c. Discuss fire hazards, extinguishers, and color coding d. Report all broken or damaged tools e. Use safety glasses or shields 2. a. Discuss personal and group responsibilities in the laboratory b. Participate in a group project on advertising c. Assist each other when needed 	<p>Safety in Industry and in the Laboratory (Included in each lesson where applicable)</p> <p>Employee and Employer Relationships in Industry (Included in lessons on personnel and unions; also in each lesson where applicable)</p>

OBJECTIVE 3: To develop desirable attitudes about his place in an industrial, technical society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <ol style="list-style-type: none"> 3. Recognize technical, aesthetic and functional qualities of design 4. Recognize and appreciate quality workmanship and standards in the products of industry 5. Recognize varied occupational opportunities offered by industry 6. Recognize the need to use materials and time as economically as possible 	<p>Have pupils:</p> <ol style="list-style-type: none"> 3. a. Compare and evaluate typical related projects 4. a. Discuss and compare two brand name products b. Discuss the quality of workmanship of products they have made c. Discuss quality control 5. Make a cross-sectional list of the employment offers 6. a. Discuss how industry utilizes scrap materials b. Determine own efficiency by comparing estimated time with actual time 	<p>Elements of Design (Included in engineering lesson, also where applicable)</p> <p>Standards and Quality Control in Industry and the Laboratory (Included under production lesson, also where applicable)</p> <p>Industrial Occupations and You (Included where applicable)</p> <p>Economy of Materials and Labor (Included where applicable)</p>

OBJECTIVE 3: To develop desirable attitudes about his place in an industrial, technical society

EXPECTED BEHAVIORAL CHANGES	PUPIL ACTIVITIES	TEACHER LESSONS
<p>The pupils will be able to:</p> <p>7. Recognize the need for care and maintenance of tools and equipment</p>	<p>Have pupils:</p> <p>6. c. Participate in a time motion study</p> <p>d. Keep a daily time ticket</p> <p>e. Practice economical layout</p> <p>7. a. Return tools to proper panels after use</p> <p>b. Participate in a personnel organization</p> <p>c. Check tools and equipment as a foreman</p> <p>d. Do simple maintenance and report those of a more complex nature</p>	<p>Care and Maintenance of Tools and Equipment (Include in each lesson where applicable)</p>

APPROACH:

Using camping equipment industries as the motivational media and wood and metal as construction materials, the pupil will be introduced to the corporate mass production industries. It should be recognized, however, that any industry using a similar organizational pattern could be substituted as a motivational factor. The specific materials and tools used are also subject to individual interests and product selection.

The pupil will be given an overview of the basic organization and functions of the mass production industries by using lectures, discussions, audio-visual aids, motion pictures, demonstrations, dramatized experiences, contrived experiences, and direct, purposeful experiences. The specific approaches taken are:

A. Finance

1. Buying stock in the organization

B. Personnel

1. Introduction of personnel organization
2. Using the job application form
3. Interviewing pupils for the jobs

C. Engineering

1. Inspecting and developing a simple engineering drawing

D. Manufacturing

1. Mass producing a product

E. Marketing

1. Analyzing the cost of producing a product
2. Packaging the product for sale.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

- Amrine, Harold T.; Ritchey, John A.; and Hulley, Oliver S.;
Manufacturing Organization and Management, Englewood Cliffs,
New Jersey: Prentice-Hall, Inc, 1966.
- Anderson, Arthur D., A Designer's Notebook, Bloomington, Illinois:
McKnight and McKnight Publishing Company, 1966.
- Bethel, Lawrence L., Industrial Organization and Management,
New York: McGraw-Hill Book Company, 1962.
- Bittel, Lester R., What Every Supervisor Should Know, New York:
McGraw-Hill Book Company, 1959.
- Common Body of Knowledge for Management Consultants, New York:
Association of Consulting Management Engineers, Inc., 1957.
- Cunningham, Beryl M. and Holtrop, William F., Woodshop Tool
Maintenance, Peoria, Illinois: Charles A. Bennet Company,
Inc., 1956.
- Dale, Edgar, Audio-Visual Methods in Teaching, New York: Henry
Holt and Company, 1954.
- Ericson, Emanuel E., Teaching the Industrial Arts, Peoria,
Illinois: Charles A. Bennett Company, Inc. 1946.
- Fraser, Roland R., General Metal Principles, Procedures, and
Projects, Englewood Cliffs, New Jersey: Prentice-Hall, Inc.,
1955.
- Groneman, Chris H., General Shop, New York: McGraw-Hill Book
Company, Inc., 1963.
- Haws, Robert W. and Schaefer, Carl J., Manufacturing in the
School Shop, Chicago, Illinois: American Technical Society,
1960.
- Lindbeck, John, Design Textbook, Bloomington, Illinois: McKnight
and McKnight Publishing Company, 1964.
- L. L. Bean, Inc., Spring Catalog, Freeport, Maine, 1968.
- Maley, Donald, Various Methods of Teaching Industrial Arts,
Prince George's County, Maryland: Industrial Arts Curriculum
Workshop, 1961
- Mager, Robert F., Preparing Instructional Objectives, Palo Alto,
California: Fearon Publishing Company, 1962.

Newell, Adnah C. Coloring, Finishing and Painting Wood,
Peoria, Illinois: Charles A. Bennett Company, 1940.

Olson, Delmar W., Industrial Arts and Technology, Englewood
Cliffs, New Jersey: Prentice-Hall, Inc., 1963.

_____, Industrial Arts for the General Shop,
Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1955.

Silvius, Harold G., Organizing Course Materials, Bloomington,
Illinois: McKnight and McKnight Publishing Company, 1961.

_____, Teaching Multiple Activities in Industrial
Education, Bloomington, Illinois: McKnight and McKnight
Publishing Company, 1956.

State of Georgia, Industrial Arts for the Middle Grades, Atlanta,
Georgia Department of Education, 1967.

State of Maine, Industrial Arts Technology, A Study of American
Industry, Augusta, Maine, Bureau of Vocational Education, 1965.

State of Maine, Interpreting Industry Through Line Production,
Augusta, Maine: Bureau of Vocational Education, 1962.

State of Maine, Labor Laws of Maine, Augusta, Maine: Commissioner
of Labor and Industry, 1965.

The Vital Link, AFL-CIO, 1964

Your New Social Security Law Report, Including Medicare, Clifton,
New Jersey: Marshall Publications, 1967.

Your Union, Building Service Employees International Union, undated

RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Solid form

- a. Industry mobile
- b. "Gas Pump" blackboard tool
- c. Picket signs
- d. Blocks to illustrate units of measure
- e. Jigs and fixtures to mass produce a product
- f. Bag of 100 pennies
- g. Test grading device
- h. Sample of product to be produced (spatula)

2. Charts, forms, information sheets, etc.

- a. Drawings for spatula - 4
- b. Drawings for jigs and fixtures - 5
- c. Job application
- d. Want ads
- e. Pay check and voucher
- f. Stocks
- g. Union organization chart
- h. Process flow chart
- i. Engineering drawing explanation chart
- j. Cost analysis chart
- k. Income tax forms, W-2, W-4, 1040
- l. Bill of material chart
- m. Sample packages
- n. Song sheet for singing commercial
- o. Weekly time sheet
- p. Line and staff organization charts
 - 1) Typical
 - 2) "Campcrafters, Inc."
- q. Applicant appraisal form
- r. Record of employment form
- s. Newspaper clippings
 - 1) Want ads
 - 2) Stock prices
 - 3) Sale of stock
- t. Language of unionism information sheet
- u. Job analysis sheet
- v. Floor plan of laboratory
- w. Sales and markets sheet

3. Other

- a. Various catalogs, magazines, etc. for product ideas
- b. Flat pictures for product ideas and motivation

4. Equipment

- a. Closed circuit television
- b. Video tape recorder
- c. 16 mm. sound projector
- d. Overhead projector
- e. Opaque projector
- f. Polaroid camera
- g. Ozalid printer

5. Films

- a. "The Factory, How a Product is Made," #11684,
University of Michigan, Audio Visual Education
Center, 720 E. Huron Street, Ann Arbor, Michigan
- b. "According to Plan," McGraw-Hill Book Company,
Engineering Drawing Series

TOOLS AND EQUIPMENT:

Common tools and equipment found in a normal laboratory

Special tools used: lathe duplicator

LESSONS TO BE TAUGHT:

- Overview of the Manufacturing Process
- Line and Staff Organization in a Corporate Manufacturing Industry
- Functions and Activities of the Finance Division of a Corporate Manufacturing Industry
- Functions and Activities of the Personnel Division of a Corporate Manufacturing Industry
- Functions and Activities of the Engineering Division of a Corporate Manufacturing Industry
- Basic Elements of Engineering Drawing
- Functions and Activities of the Production Division of a Corporate Manufacturing Industry
- Development, Organization and Function of Unions
- Safety in Industry and the Laboratory
- Maintenance Procedures
- Common Cutting Processes
- Common Forming and Shaping Processes
- Common Layout Processes
- Common Holding Processes
- Common Finishing Techniques
- Common Assembly Techniques
- Functions and Activities of the Marketing Division of a Corporate Manufacturing Industry

Title: Overview of the Manufacturing Process

Presentation:

- I. Corporation set-up
 - A. Line and staff
 - B. What is a corporation
- II. Procedures for manufacturing a product
 - A. Planning board
 1. Idea
 2. Rough sketches
 3. Model
 4. Approval
 - B. Engineering and tooling
 1. Tools and materials needed
 2. Make tools and blueprints
 - C. Purchasing department - orders materials
 - D. Personnel department
 1. Hire help
 2. Train help
 - a. To operate necessary machines
 - b. Leadership positions
 - E. Receiving department - receives materials
 - F. Production line and manufacture of product
 1. Set-up of line
 2. Mass production of parts
 3. Assembly
 4. Check quality
 - G. Package, sell, ship
- III. Pupil activities
 - A. View specific jobs in the manufacture of a product
 - B. Participate in pupil personnel organization

Teaching Aids:

Film: "The Factory"

16 mm. projector

Overhead projector

Sample jig and fixtures

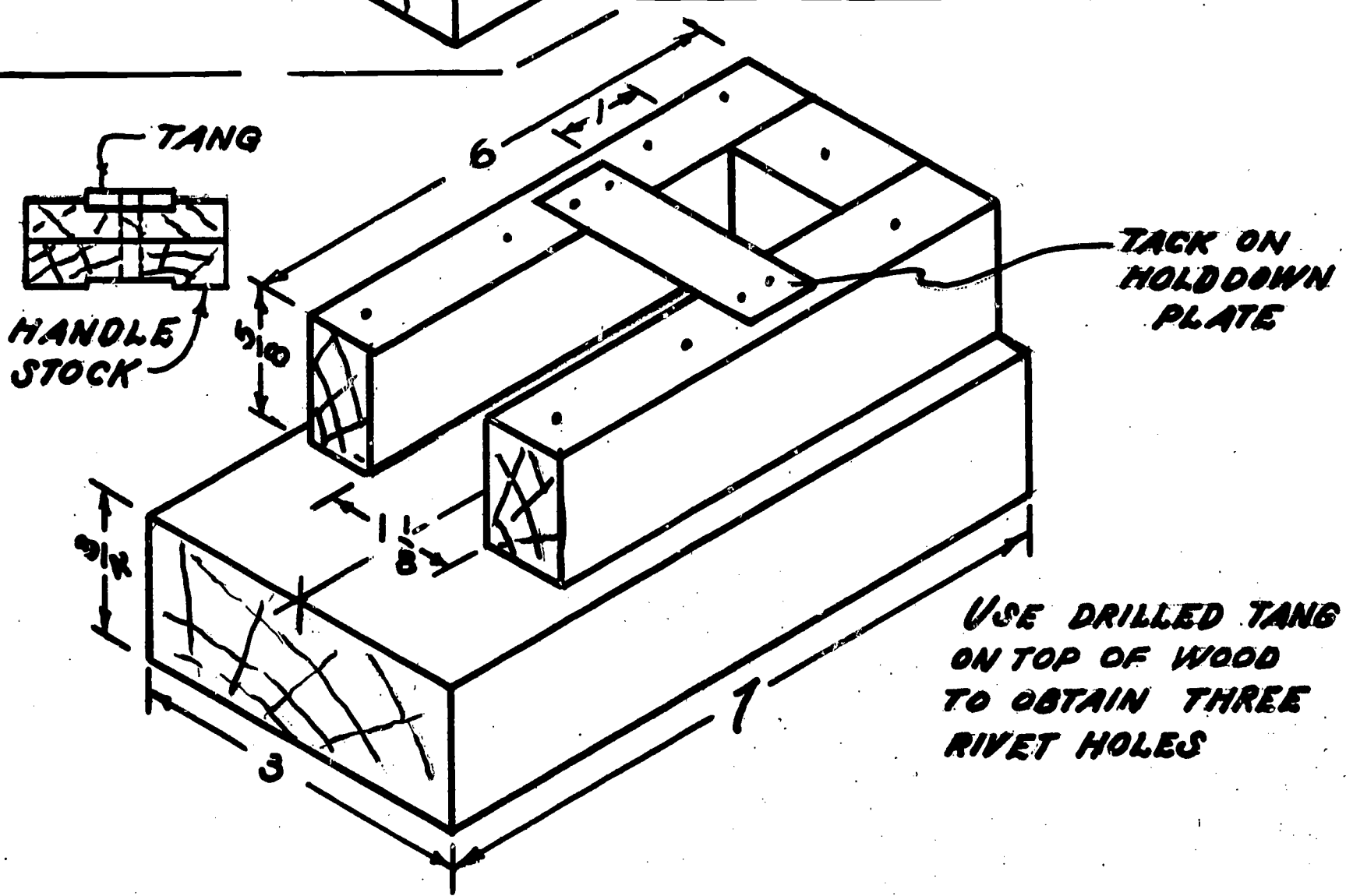
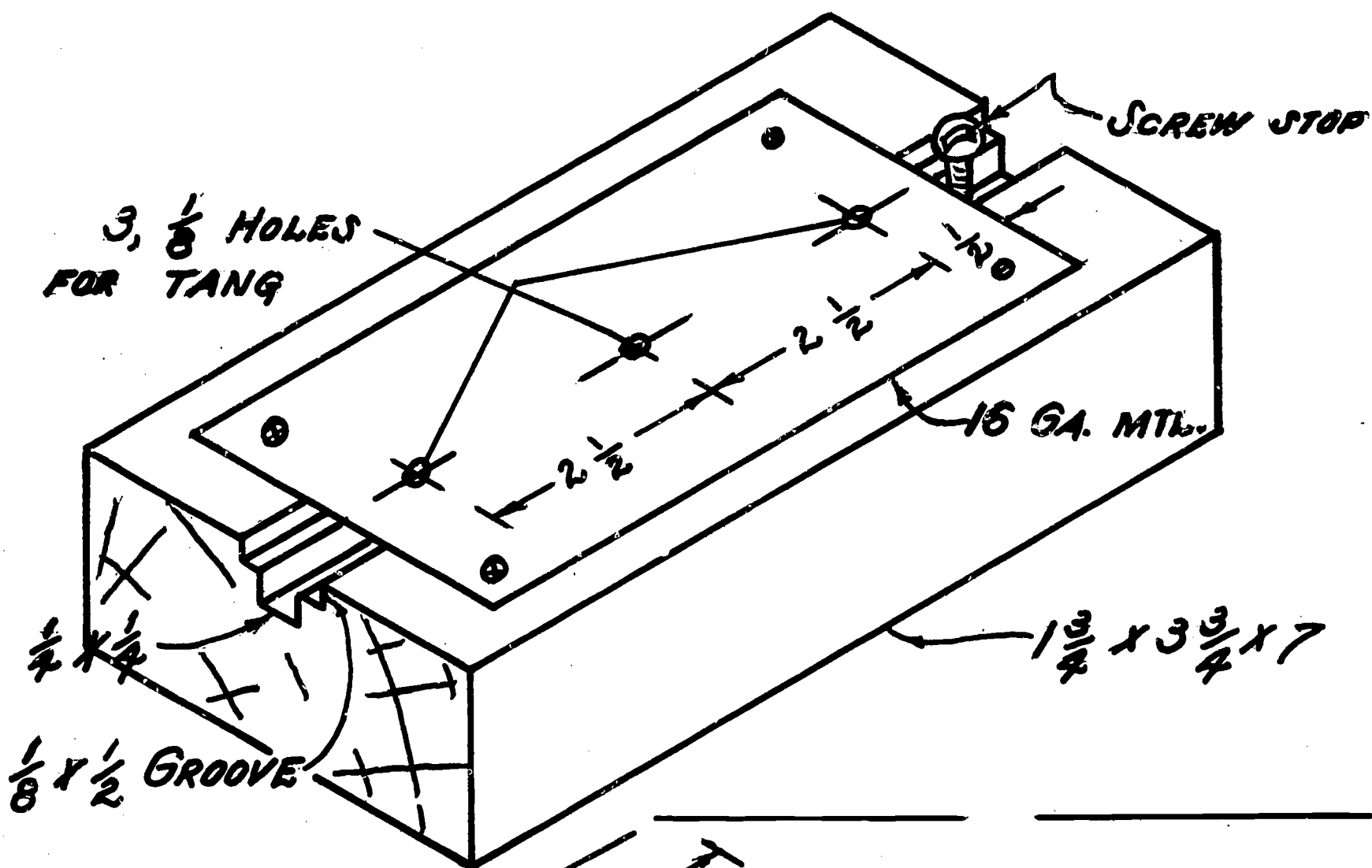
Floor plan of laboratory

Flow chart

Sample package of materials

Sample product

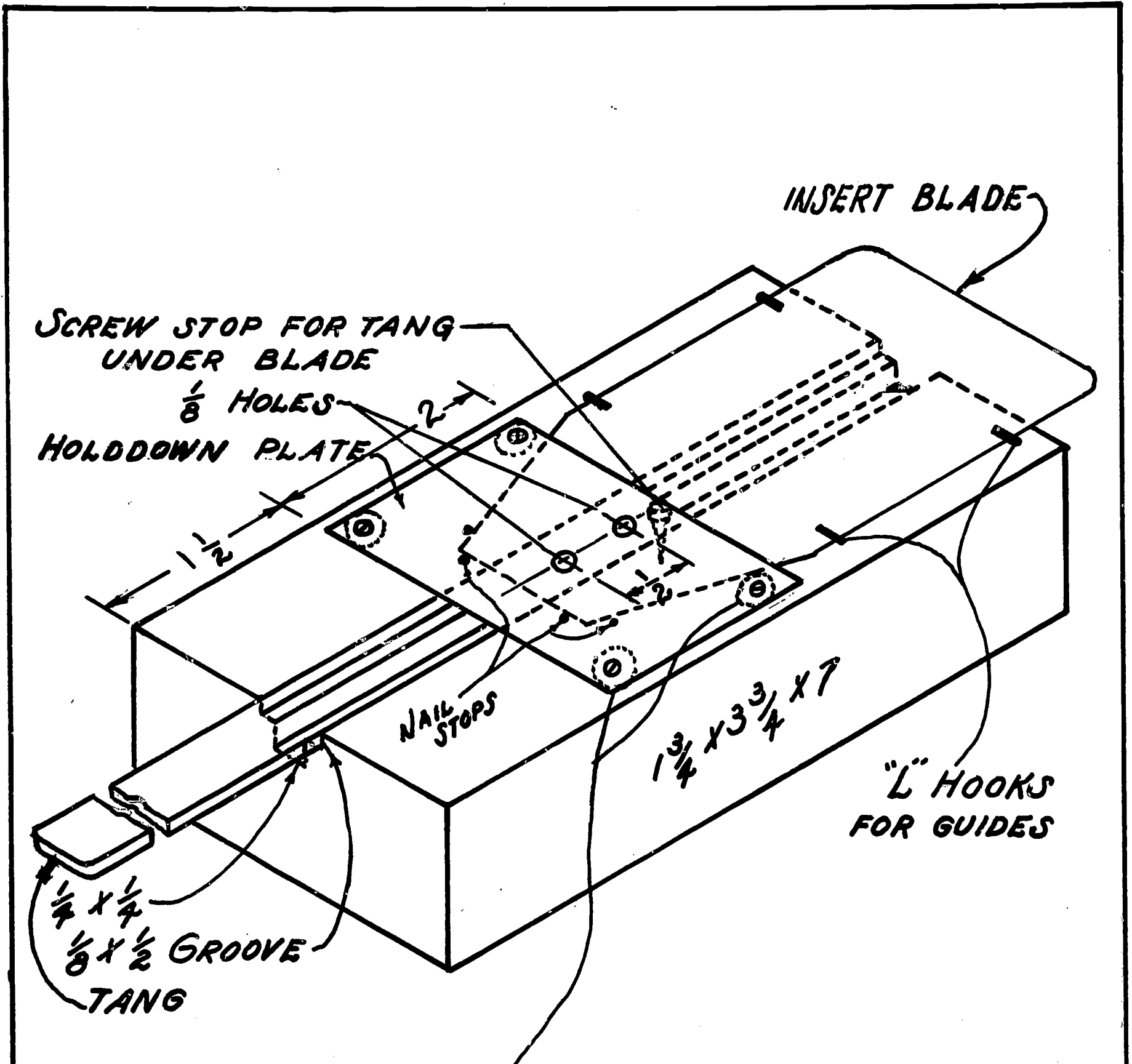
Drawings



CAMPCRAFTERS, INC.
GORHAM, ME.

HANDLE & TANG
DRILLING JIGS

DR. BY R. Jean
CK. BY A. Knicker



WASHERS FOR SPACERS

NOTE: ✓ MAKE BOTH $1\frac{3}{4}$ DRILL JIGS FROM SAME STOCK, CUT IN HALF AFTER PLOUGHING GROOVES.
 ✓ DRILL BOTH PIECES TOGETHER, TANG & BLADE

CAMPCRAFTERS, INC. GORHAM, ME.	BLADE & TANG DRILLING JIG	DR. BY <i>L. Jean</i> CK. BY <i>A. Knowlton</i>
-----------------------------------	------------------------------	--

SHEAR BLADE
LINE

PIECE TO BE CUT
(BLADE)
SEE DWG. FOR SIZE

3

CRIMP - 3 SPOTS

MATERIAL: 18GA. SHEET STEEL

BEND TO FIT TABLE
THICKNESS - FRONT EDGE

CAMPCRAFTERS, INC
GORHAM, ME.

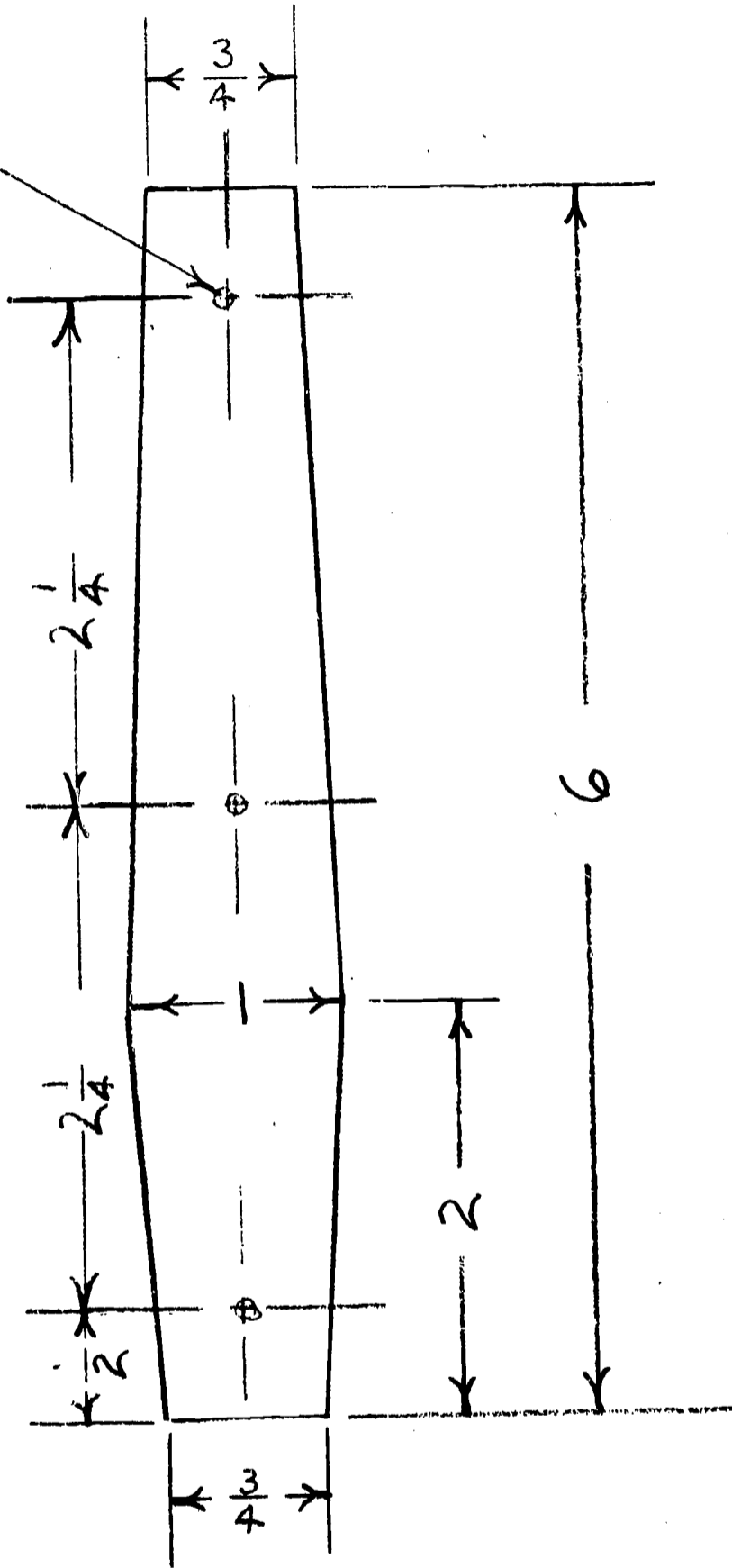
JIG FOR CUTTING
BLADE ANGLE

DR. BY.

CK. BY.

[Signature]
[Signature]

PUNCH $\frac{1}{8}$ - 3 HOLES



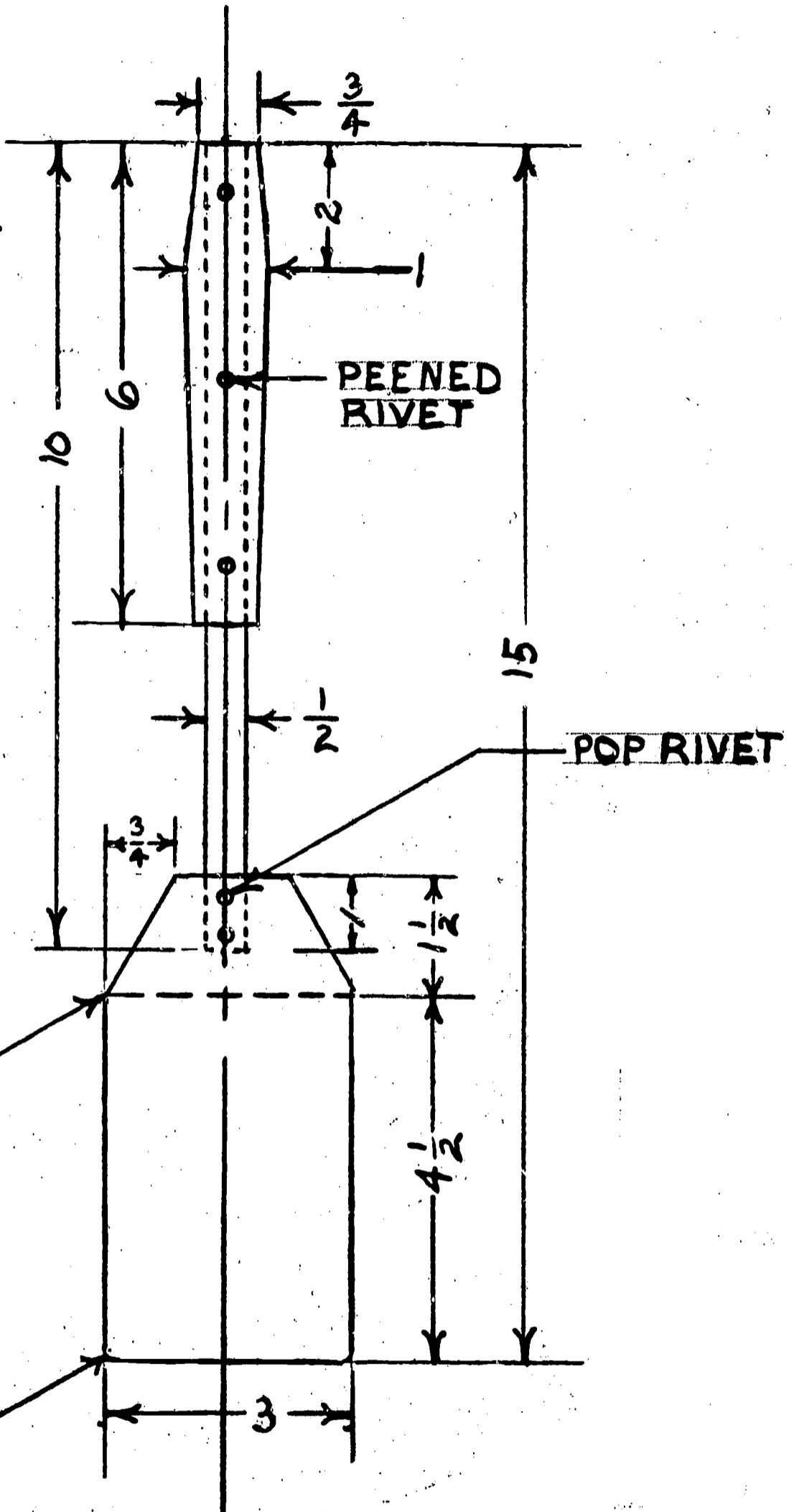
MATERIAL: 18 GA.
SHEET STEEL

CAMPCRAFTERS GORHAM, ME.	HANDLE SHAPE TEMPLATE	DR. BY. <i>[Signature]</i> CK. BY.
-----------------------------	--------------------------	---------------------------------------

NOTE: BREAK ALL SHARP EDGES

BEND UP 30°

$\frac{1}{8}$ R.

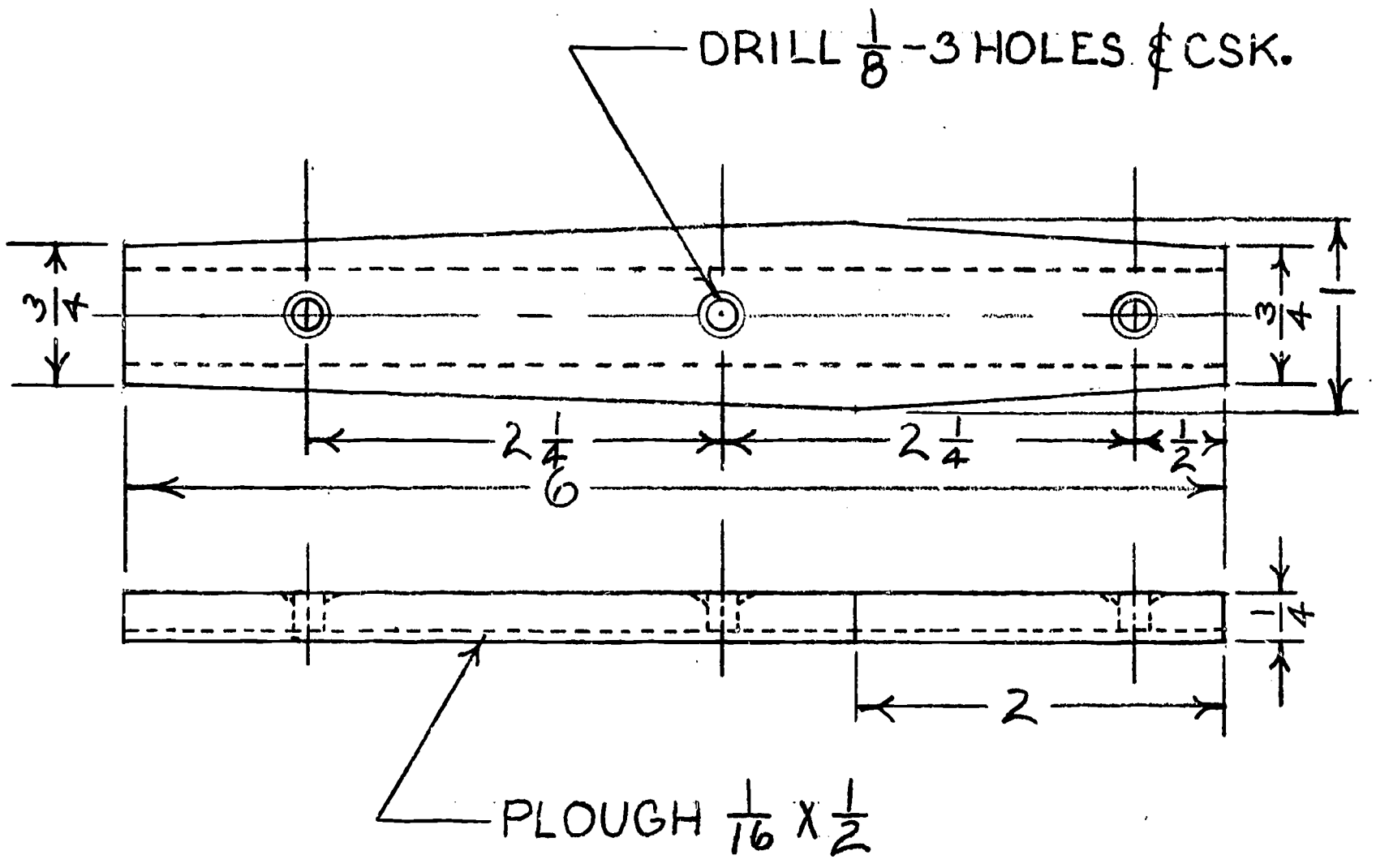


CAMPCRAFTERS
GORHAM, ME.

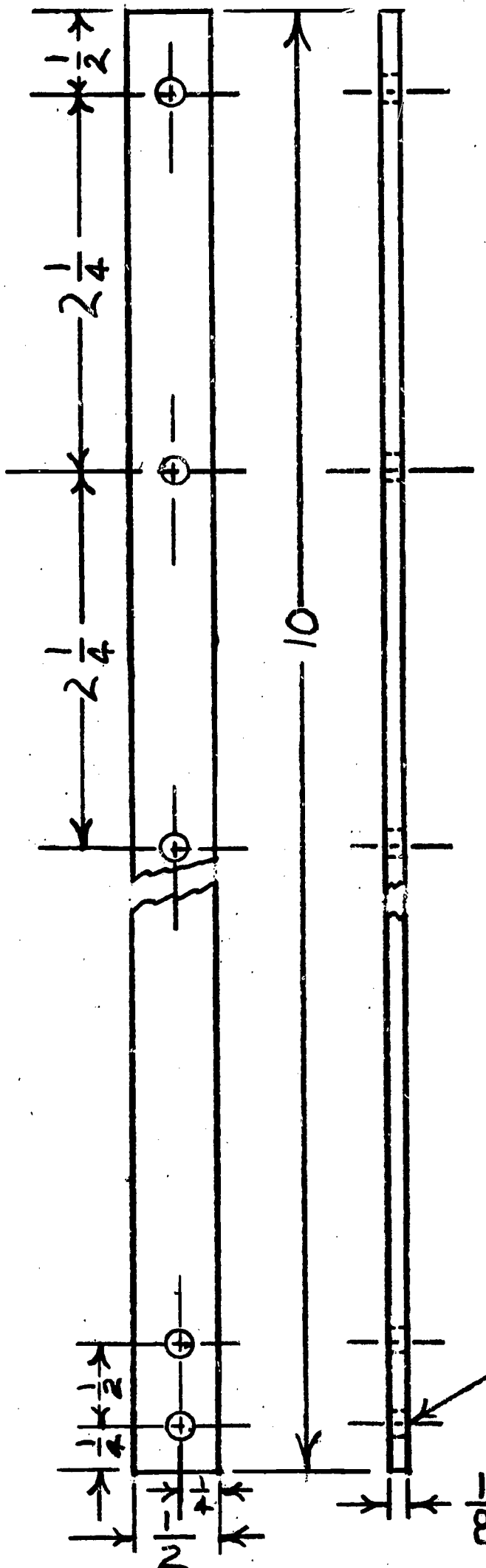
SPATULA ASSEM.

SCALE: 6"=1'-0"

DR. BY *J. Perry*
CK. BY *R. J. Jean*



CAMPCRAFTERS GORHAM, ME.	HANDLE DETAIL SCALE: FULL	DR. BY. <i>J. L. ...</i> CK. BY. <i>A. ...</i>
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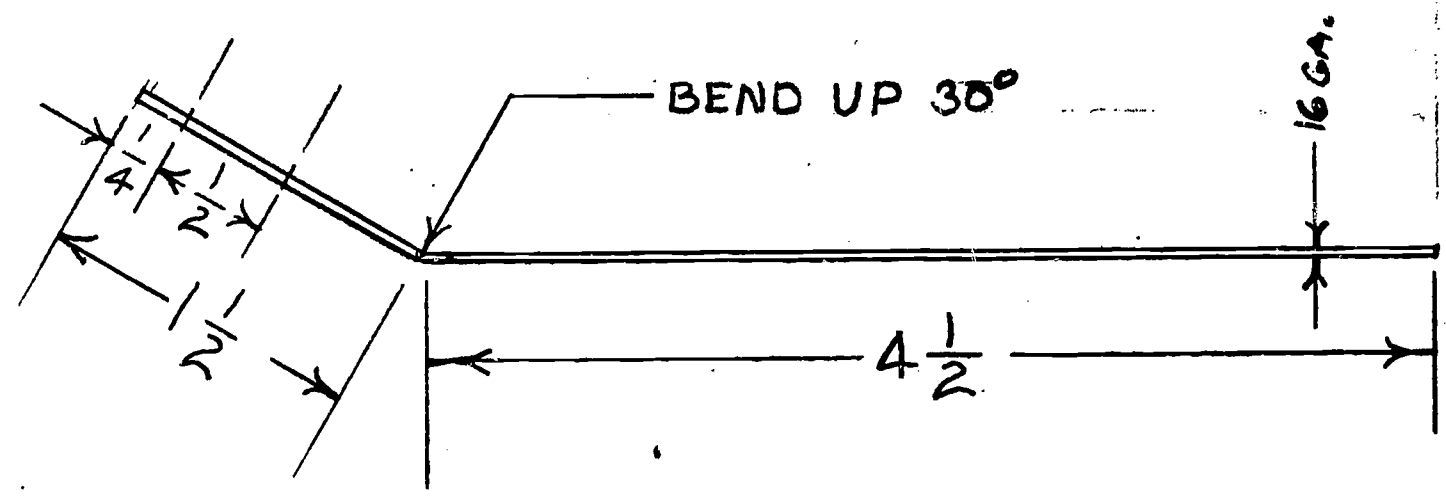
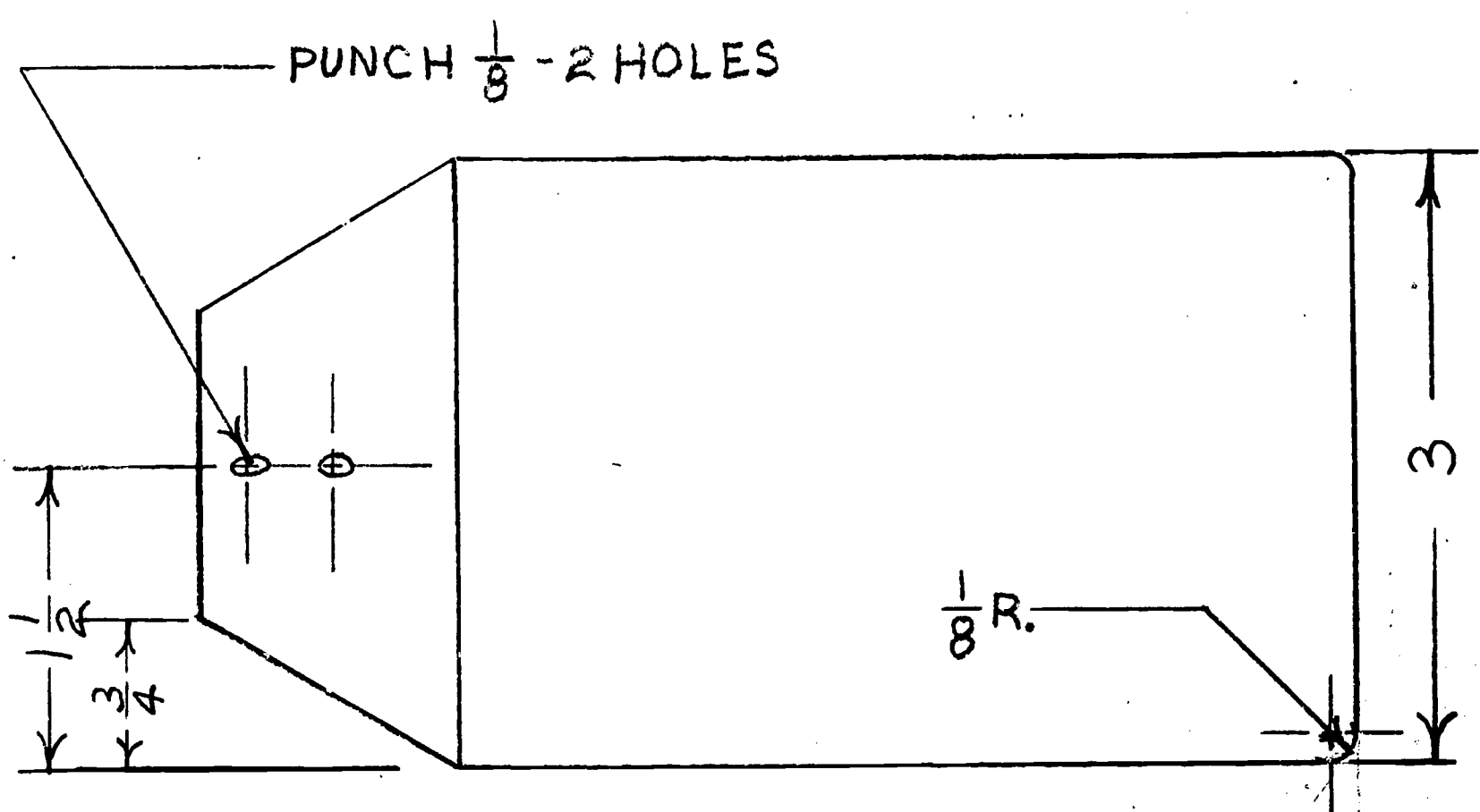


DRILL $\frac{1}{8}$
5 HOLES

CAMPCRAFTERS
GORHAM, ME.

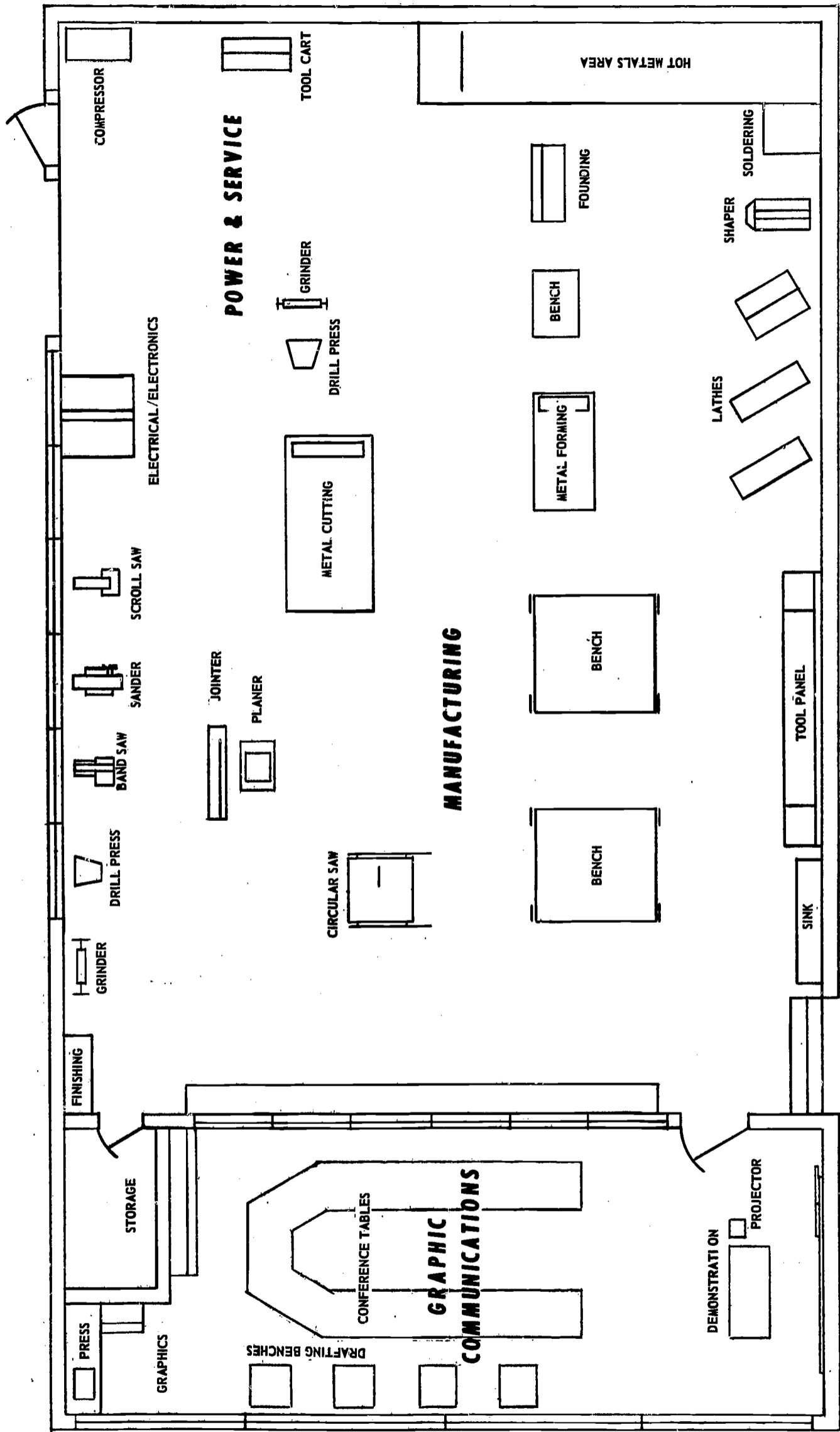
TANG DETAIL
SCALE: FULL

DR. BY. *J. F. ...*
CK. BY. *W. L. Fuller*



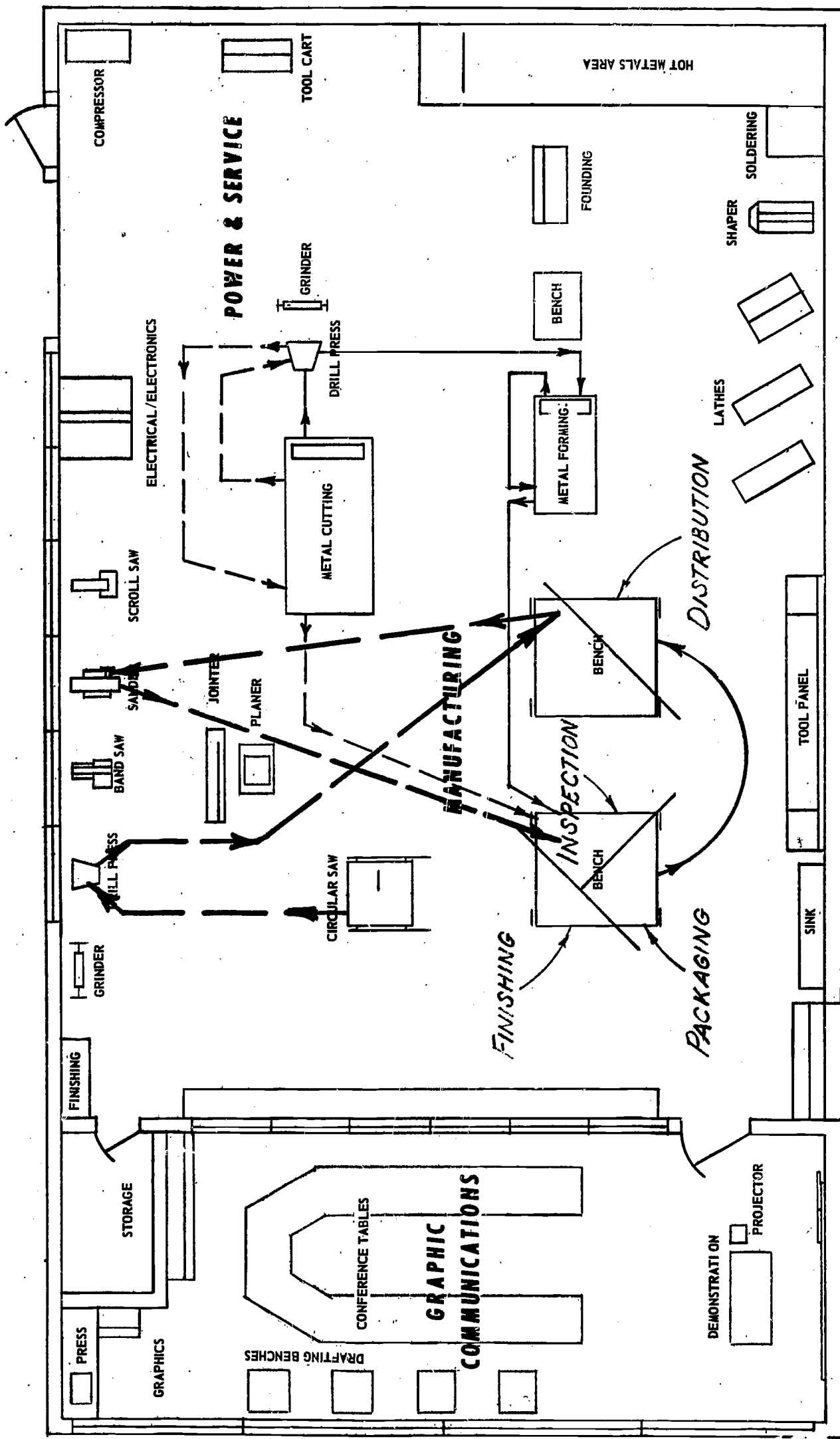
NOTE: BREAK ALL SHARP EDGES

CAMPCRAFTERS GORHAM, ME.	BLADE DETAIL SCALE: FULL	DR. BY <i>J. [Signature]</i> CK. BY <i>H. [Signature]</i>
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LABORATORY OF INDUSTRIES

GORHAM STATE COLLEGE



LABORATORY OF INDUSTRIES
 GORHAM STATE COLLEGE

PRODUCTION FLOW CHART FOR SPATULA

BLADE

TANG

HANDLE

JOB ANALYSIS
FOR
PRODUCTION OF SPATULA

BLADE

- | | | |
|---|-------------------|-------------------------|
| 1. Cut angles | Shear | Janice Leavitt |
| 2. Drill rivet holes in
blade, using jig | Drill press | Andrew Bent |
| 3. Bend 30 degree angle;
remove burrs and
file radius | Brake

File | Nancy Fish
(Foreman) |

TANG

- | | | |
|---|-------------------------|-------------------------|
| 1. File burrs and polish | File | Linda Arthur |
| 2. Drill handle holes
and remove burrs | Drill press

File | Mark Beede
(Foreman) |

HANDLE

- | | | |
|---|-------------------------------|---------------------------|
| 1. Drill holes | Drill press | Joe Ramsdell
(Foreman) |
| 2. Countersink for
riveting

Layout pattern on
handle | Hand drill

Countersink | Sherry Green |
| 3. Cut rivets and peen
handle to tang | Ball peen hammer | John Hoyt |
| 4. Shape handle | Sander | Alan McLucas |
| 5. Hand sand | Sandpaper | Pamela Kirkpatrick |

JOB ANALYSIS FOR PRODUCTION OF SPATULA (Continued)

ASSEMBLY

- | | | |
|------------------------------------|-----------------|---------------------------------|
| 1. Pop rivet blade to
tang | Pop riveter | Kristene Carpenter
(Foreman) |
| 2. Dip handle in oil
for finish | Oil finish | Matt Skehan |
| 3. Final inspection | Quality control | Penny Briggs |

PACKAGING

- | | | |
|-----------------------|--|-------|
| 1. Put label in bag | | |
| 2. Put spatula in bag | | |
| 3. Tie bag | | |
| 4. Box for shipping | | Group |

Title: Line and Staff Organization in a Corporate Manufacturing Industry

Presentation:

- I. Need for organization
 - A. Number of people
 - B. Number of operations
- II. Levels of line organization
 - A. Board of directors
 - B. President
 - C. Department managers
 1. Engineering
 2. Market and sales
 3. Manufacturing
 4. Finance
 5. Personnel
 - D. First line supervisors
 - E. Workers or employees
- III. Staff organization
 - A. Advisor
 - B. Control
 - C. Service
 - D. Coordinating
- IV. Organization of "Campcrafters, Inc."
 - A. Line organization
 - B. Staff organization
- V. Pupil personnel organization

References:

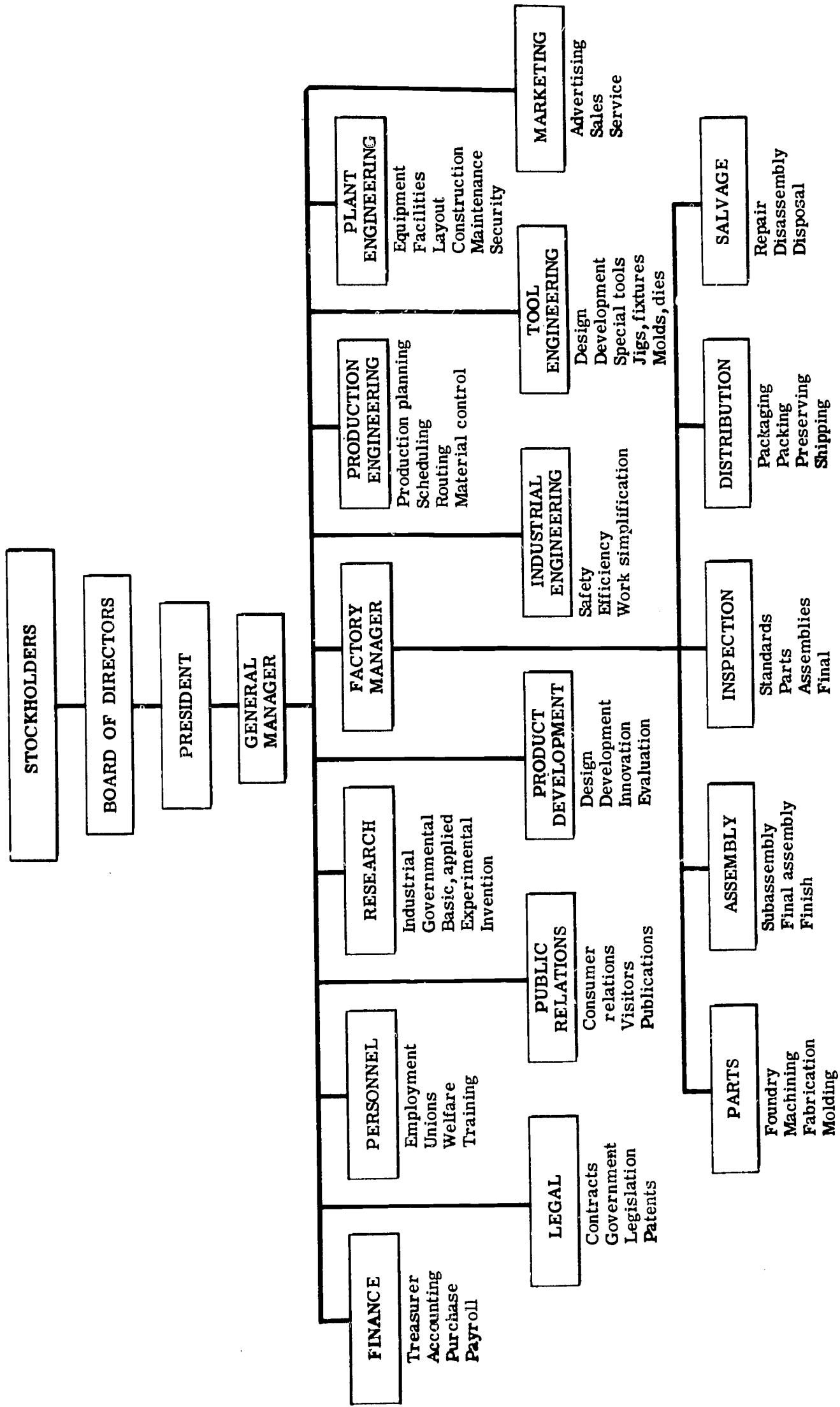
Amrine, Ritchey, Hulley, Manufacturing Organization and Management, Chapter 3

Olson, Delmar, Industrial Arts for the General Shop, Chapter 1

Teaching Aids:

Overhead Transparencies

1. Organization of a Typical Manufacturing Organization
2. Organization of Campcrafters, Inc.
3. Mobile - Elements of Industry



Typical functional structure of manufacturing industries.

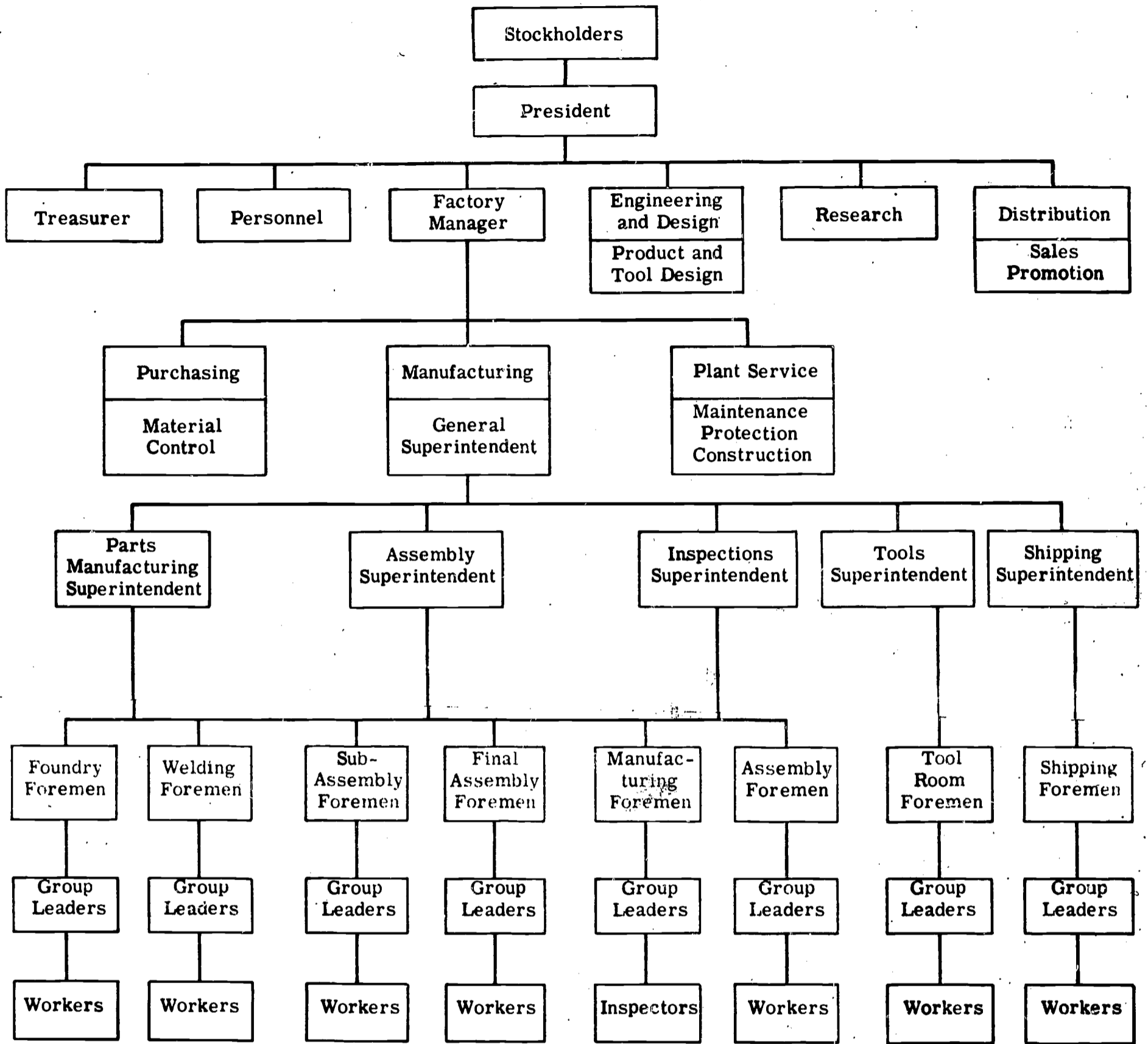
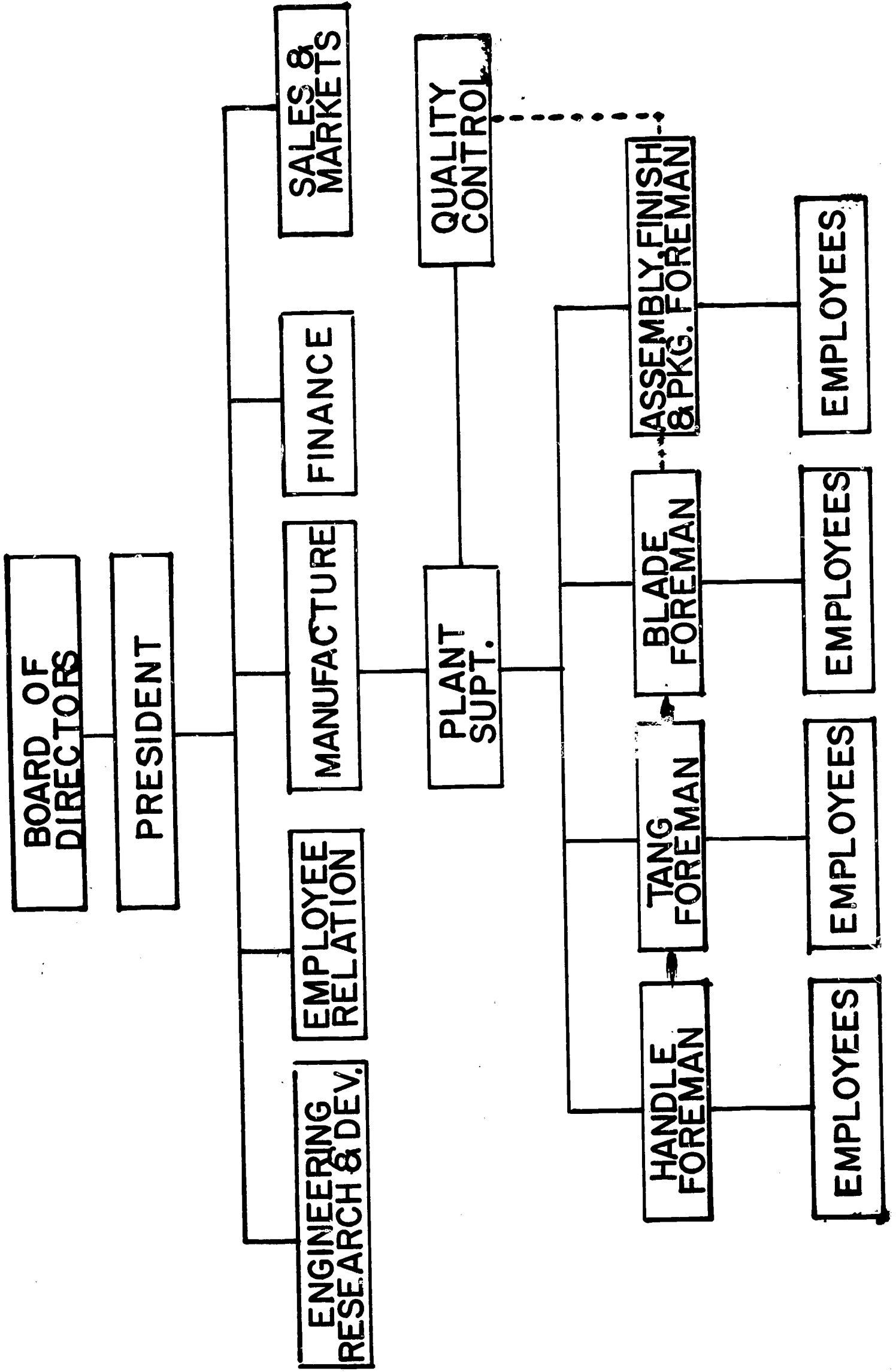
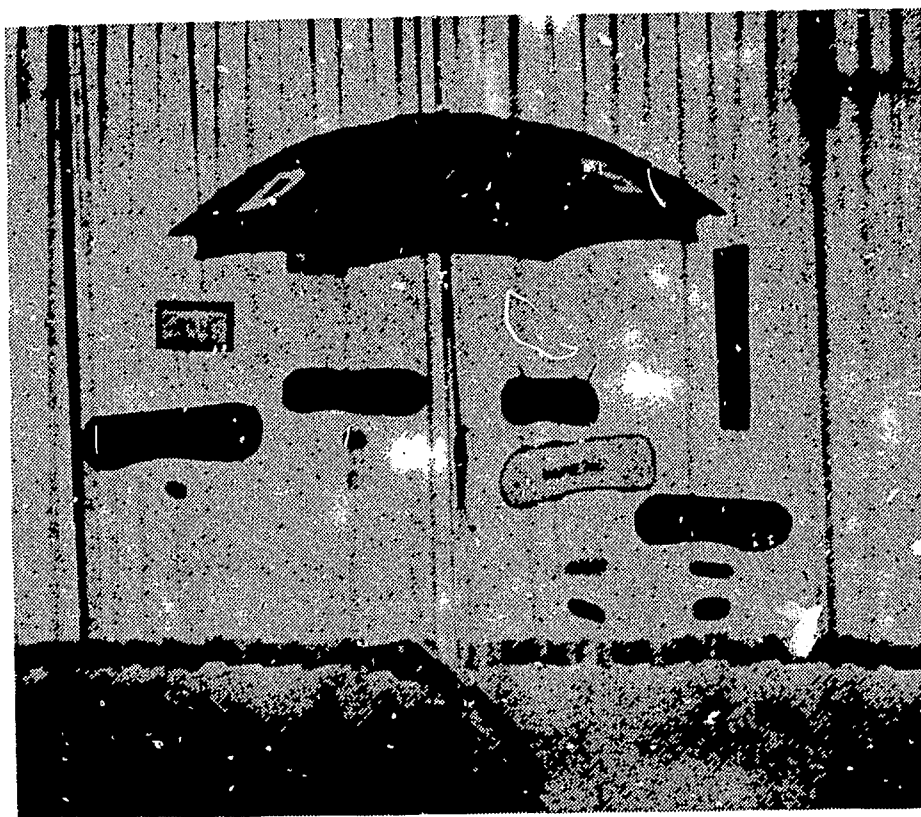


Fig. 1.3. Flow chart showing the personnel organization of a manufacturing industry. The stockholders are the owners of the company. They have invested their money to buy stock. They elect a board of directors, and the directors appoint the president, who is responsible for operating the plant. Small groups of workers are supervised by group leaders. The group leaders are responsible to foremen, who in turn are responsible to their superintendent, and so on up the line. In a large industry there may be fifty or more separate departments, each with a specific type of work. The activities of all these departments, which may include many thousands of employees, must be accurately coordinated so that the products can flow off the production line on schedule.
 Delmar W. Olson, Industrial Arts for the General Shop

ORGANIZATION OF CAMPCRAFTERS, INC.



THE INDUSTRY MOBILE



This mobile was developed to depict the scope and divisions of industry and the involvement of the students and participants in the NDEA Institute at Gorham State College of the University of Maine during the summer of 1968.

The umbrella represents industry. Extending from five of the ribs are the functions of industry (Engineering, Finance, Marketing, Production, and Personnel) giving the feeling that if one of the ribs (or functions) were missing, the umbrella (Industry) would collapse. Hanging from the remaining ribs are: 1) The brochure explaining the NDEA Institute representing the governments involvement, 2) A dollar depicting the fact that money is needed for the institute, 3) the seal of Gorham State College depicting the fact that Dr. John Mitchell and the staff of the Industrial Education Center are involved with the institute and actively engaged in the teaching of Industry and Industrial Arts.

At the end of the handle one finds a product manufactured by the students of one of the teams of the institute. This represents the ultimate outcome of all manufacturing industries.

This mobile now hangs in the main lobby of the Industry and Technology Center of Gorham State College, Gorham, Maine.

Title: Functions and Activities of the Finance Division of a
Corporate Manufacturing Industry

Presentation:

I. Stocks

- A. A share in the corporation
- B. Voting rights of a stockholder
- C. Corporation control
 - 1. Mock election of chairman of the board to illustrate the one share-one vote idea
 - 2. Further stock issues
 - a. Advantage - larger working capital
 - b. Disadvantage - dilution of ownership

II. Bonds

- A. A method of borrowing money
- B. Fixed interest
- C. Comparison with stocks
 - 1. Bond interest paid first
 - 2. Stock income determined by corporation profits - not a fixed amount

III. Security exchanges

- A. Listed corporations must meet minimum standards
- B. Meeting place for brokerage firms

IV. Wages and salaries - comparison of job opportunities

- A. White collar workers - salaried office workers
- B. Skilled workers - the trained technician
- C. Semi-skilled workers - machine operators
- D. Unskilled workers - little or no training

V. Weekly time sheet

- A. Sheets kept by employees
- B. Automatic time clock and card

VI. Accounting divisions responsibilities in the payroll

A. Computation of payroll

B. Payroll deductions

1. Income tax forms, W-2, W-4, 1040
2. Social security - employer and employee each pay
 - a. Old age insurance
 - b. Medicare
3. Other possible deductions
 - a. Check-off of union dues
 - b. Hospital insurance (some companies)
 - c. Voluntary deductions
 - 1) Government bonds
 - 2) Credit unions
 - 3) Life insurance
 - 4) Charity
4. Yearly totals to date - W-2 form

C. Workmens Compensation - paid by employer

VII. Pupil activity

- A. Fill out time sheet
- B. Compute payroll with standard deductions
- C. Fill out payroll check, using proper form
- D. Purchase shares of stock in a mock corporation
- E. Participate in stockholders' meeting
- F. Elect the chairman of the board of a mock corporation

References:

Amrine, Ritchey and Hulley, Manufacturing Organization and Management, pp. 453-4, 456-460

Your New Social Security Law Report, Including Medicare, Clifton, New Jersey, 1967, Marshall Publications

Teaching Aids:

Overhead Transparencies

1. A section of the daily stock report
2. W-2 form
3. W-4 form
4. 1040 form
5. Weekly time sheet
6. 100 pennies (to show percent of deductions)

Newspaper article on a local corporation's sale of stock

Copies of a share of stock in the pupils' company

Payroll checks - with deduction voucher attached

Weekly time sheets - for each pupil to fill out

New York Stocks At 11 A.M.

NEW YORK (UPI)—Stocks:		Trans World Airlines	46 ³ / ₄ — ¹ / ₄
Air Reduction	31 ³ / ₈ + ¹ / ₄	Union Carbide	44 ³ / ₈ + ¹ / ₈
Allegheny Ludlum St	55 ⁷ / ₈	United Airlines	43 — ¹ / ₄
Allied Chemical	36 ¹ / ₂	United Gas Imp	23 ³ / ₄
Allis Chalmers	29 — ¹ / ₈	Uniroyal	58 ³ / ₈ — ³ / ₈
Alcoa	68 — ¹ / ₂	US Smelting	64 ¹ / ₂ + ³ / ₈
American Can	50 ¹ / ₂ — ¹ / ₄	US Steel	39 ³ / ₈ — ¹ / ₄
American Cyanamid	28 ¹ / ₈ + ³ / ₈	W Va P & P	54 ¹ / ₄ + ¹ / ₄
American Motors	12 ⁵ / ₈ — ¹ / ₈	Western Union	48 ¹ / ₄ + ⁵ / ₈
American Tel & Tel	50 ⁷ / ₈ + ¹ / ₄	Westinghouse Elec	75 ¹ / ₄ + ¹ / ₄
Anaconda	48 ⁷ / ₈ —1 ¹ / ₈	Wheeling Steel	30 ¹ / ₄ — ¹ / ₄
Armco Steel	51 ³ / ₈ + ¹ / ₈	White Motors	48 ¹ / ₈ — ¹ / ₂
Bethlehem Steel	30 — ¹ / ₄	Winn dx	33 ¹ / ₄ + ¹ / ₂
Boeing Aircraft	67 ³ / ₄ +1	Xerox Corp	284 ¹ / ₂ + ³ / ₄
Borden	33 ³ / ₈ + ¹ / ₄	Youngstown S & T	37 ³ / ₈ + ⁵ / ₈
Chesapeake & Ohio	67	Zenith	55 ¹ / ₈
Chrysler	68 ³ / ₈ + ¹ / ₂		
Coca Cola	77 +1 ¹ / ₈		
Consolidated Nat Gas	30 ¹ / ₄		
Continental Can	58 + ³ / ₈		
Corn Products	40 ³ / ₄ + ³ / ₈		
Crane	48 + ¹ / ₄		
Curtiss Wright	27 ¹ / ₄ + ⁵ / ₈		
Dow Chemical	80 ³ / ₈ — ³ / ₈		
Dresser	37		
DuPont	164 ¹ / ₄ + ¹ / ₄		
Eastern Airlines	34 ¹ / ₈ + ¹ / ₈		
Eastman	78 ⁷ / ₈ — ¹ / ₈		
Ford	54 + ¹ / ₄		
General Dynamics	56 ⁵ / ₈ — ³ / ₈		
General Electric	86 + ¹ / ₈		
General Motors	83 ⁷ / ₈ + ³ / ₈		
Greyhound	24 ⁵ / ₈ + ¹ / ₈		
Gulf Oil	80 ³ / ₄		
Hershey	29 ³ / ₄ — ³ / ₈		
Ingersol Rand	48 ¹ / ₈ + ¹ / ₈		
International Harv	33 ⁷ / ₈ + ³ / ₈		
International Nickel	100 ³ / ₄ + ¹ / ₄		
International Tel&Tel	56 + ¹ / ₄		
Interpace	31 ¹ / ₈		
Jones & Laughlin	67 ³ / ₈ + ¹ / ₈		
Joy Manufacturing	32 — ¹ / ₄		
Koppers	34 ¹ / ₄ — ¹ / ₈		
Kresge	39— ³ / ₈		
Kroger	30 ⁷ / ₈ + ¹ / ₈		
Latrobe Steel	28 ³ / ₈ + ¹ / ₂		
LOF Glass	63 — ³ / ₈		
Mc Don Dgls	52 ¹ / ₈		
MMM	107 ³ / ₈ + ¹ / ₄		
Mobil Oil	50 ¹ / ₄ + ¹ / ₈		
Montgomery Ward	32 ³ / ₈		
Motorola	145 +1 ¹ / ₄		
Murphy Co	30 ⁷ / ₈ + ¹ / ₈		
National Aviation	43 + ¹ / ₈		
National Dist	40 ³ / ₄ — ⁷ / ₈		
North American Rock	37 ¹ / ₂ + ¹ / ₄		
Pan American	23 — ¹ / ₄		
Penney	81		
Penn D Cm	27 ⁵ / ₈ +1 ¹ / ₄		
Penn NY Central	75 ¹ / ₂ —1		
PepsiCo	47 ⁷ / ₈ — ³ / ₈		
Polaroid	113 ¹ / ₂ + ³ / ₈		
PPG Industries	82 ¹ / ₂ — ¹ / ₈		
Procter Gamble	95 ⁵ / ₈ — ¹ / ₄		
RCA	47 ¹ / ₂ — ¹ / ₈		
Reading	24 ¹ / ₄ + ³ / ₈		
Sears Roebuck	72 — ¹ / ₄		
Simmons	47 — ⁵ / ₈		
Sperry Rand	48 ⁵ / ₈ +1 ¹ / ₈		
Standard Oil Cal	65 ⁷ / ₈		
Standard Oil NJ	74 ¹ / ₄ — ¹ / ₈		
Standard Oil Ohio	66 ¹ / ₂ — ¹ / ₄		
Stewart Warner	36 ¹ / ₂ — ¹ / ₈		
Texaco	80 ³ / ₄ — ¹ / ₈		
Timken Roller Brng	38 ³ / ₄ — ¹ / ₄		

1

WAGE AND TAX STATEMENT 1965

Copy A—For District Director

Type or print EMPLOYER'S identification number, name, and address above.

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages ¹ paid subject to withholding in 1965	Other compensation ² paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965
Type or print EMPLOYEE'S social security number →			¹ Before payroll deductions or "sick pay" exclusions. ² The block marked "Other compensation" is for use in reporting salary or other compensation which was not subject to withholding and which was heretofore reported on Form 1099. In 1965 this type of income may be shown on either the W-2 or the 1099 (but not on both).	
Type or print EMPLOYEE'S name and address above.			FOR USE OF INTERNAL REVENUE SERVICE Employee's copy and employer's copy compared.....	

FORM W-2—U.S. Treasury Department, Internal Revenue Service

EMPLOYER: See instructions on back of copy D.

e59-10-76793-1

UNIVERSITY OF MAINE, ORONO, MAINE

SUBSISTENCE	GRAND PAY	F.I.T.	F.I.C.A.	AMOUNTS	TYPE OF DEDUCTION
	10000	1451		8549	
DEDUCTIONS →					
62868	10000	1451		8549	
PERIOD ENDING	YEAR-TO-DATE EARNINGS	YEAR-TO-DATE F.I.T.	YEAR-TO-DATE F.I.C.A.	NET AMOUNT	

STATEMENT OF EARNINGS AND DEDUCTIONS

KEEP THIS STUB FOR YOUR RECORDS

STATE COLLEGES PAYROLL ACCOUNT

DEDUCTION CODE

1. STATE GROUP LIFE INSURANCE
2. BLUE CROSS
3. M.S.E.A.
4. STATE PENSION
5. STATE SURVIVORS BENEFITS
6. R.A.A.F.
7. T.I.A.A.—C.R.E.F.
8. UNION MUTUAL HOSPITAL INSURANCE
9. UNION MUTUAL LIFE INSURANCE
10. MISCELLANEOUS

WAGE AND TAX STATEMENT 1965

Copy B—To be filed with employee's tax return

Type or print EMPLOYER'S identification number, name, and address above.

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages ¹ paid subject to withholding in 1965	Other compensation ² paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965
Type or print EMPLOYEE'S social security number → <div style="border: 1px solid black; height: 40px; width: 100%;"></div>			¹ Before payroll deductions or "sick pay" exclusions. ² The block marked "Other compensation" is for use in reporting salary or other compensation which was not subject to withholding and which was heretofore reported on Form 1099. Add this item to wages in figuring the amount to be reported as wages and salaries on your income tax return. This is not a tax return but you must file it with Form 1040A, or Form 1040. See instructions on other side and on back of Copy C.	
Type or print EMPLOYEE'S name and address above. <div style="border: 1px solid black; height: 40px; width: 100%;"></div>			FOR USE OF INTERNAL REVENUE SERVICE	
			Employee's copy and employer's copy compared.....	

FORM W-2—U.S. Treasury Department, Internal Revenue Service

659-16-78793-1

NOTICE TO EMPLOYEE:

1. **Income Tax Wages.**—This statement is important. It must be filed with your U.S. Income Tax Return for 1965. If your social security number, name, or address is stated incorrectly, correct the information on copy B and notify your employer.
2. **Social Security Wages.**—If your wages were subject to social security taxes, but are not shown, your social security wages are the same as wages shown under "INCOME TAX INFORMATION," but not more than \$4,800.
3. **Credit For F.I.C.A. Tax.**—If more than \$174.00 of F.I.C.A. (social security) employee tax was withheld during 1965 because you received wages from more than one employer, the excess should be claimed as a credit against income tax. See instructions with your income tax return.

U.S. GOVERNMENT PRINTING OFFICE 659-16-78793-1

WAGE AND TAX STATEMENT 1965

Copy C—For employee's records

Type or print EMPLOYER'S identification number, name, and address above.

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages ¹ paid subject to withholding in 1965	Other compensation ² paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965 ³

Type or print EMPLOYEE'S social security number →

┌

└

Type or print EMPLOYEE'S name and address above.

¹ Before payroll deductions or "sick pay" exclusions.

² The block marked "Other compensation" is for use in reporting salary or other compensation which was not subject to withholding and which was heretofore reported on Form 1099. Add this item to wages in figuring the amount to be reported as wages and salaries on your income tax return.

³ If your wages were subject to social security taxes, but are not shown, your social security wages are the same as wages shown under "Income Tax Information," but not more than \$4,800.

Keep this copy as part of your tax records.

FORM W-2—U.S. Treasury Department, Internal Revenue Service

e59-16-78793-1

INSTRUCTIONS FOR FILING U.S. INCOME TAX RETURN

Who Must File.—If your income in 1965 was \$600 or more (\$1,200 if 65 years of age or over), or your net earnings from self-employment were \$400 or more, you must file an income tax return. Forms may be obtained from the District Director of Internal Revenue, your employer, bank, or post office.

A single person with income of less than \$600 (\$1,200 if 65 years of age or over) should file a return to get a refund if tax was withheld. A married person with income less than her (his) own personal exemption(s) should file a joint return with husband or wife to get the smaller tax or larger refund. To assure any benefit of the split-income provisions, a married couple should file a joint income tax return.

Filing on Form 1040A.—Form 1040A may be used if your gross income (or the combined income of husband and wife) was less than \$10,000 and consisted entirely of wages reported on Wage and Tax Statements (Forms W-2) and not more than \$200 of dividends, interest, and other wages not subject to withholding.

If you file Form 1040A and your income is less than \$5,000, you may figure your own tax or let the Internal Revenue Service do it for you. If your income is \$5,000 or more but less than \$10,000, you

must use the standard deduction and compute your own tax. The use of the tax table or the standard deduction eliminates the need to list contributions, interest, taxes, losses, medical expenses, child care expenses, and certain miscellaneous deductions. The tax tables and tax computation schedule are provided in Form 1040A instructions for this purpose. If you compute your tax any balance due must be paid in full with the return. If the Service computes the tax for you and there is an underpayment, a bill will be sent to you. In any case where there is an overpayment a refund check will be sent to you.

File Form 1040 instead of Form 1040A if—(1) you had income from sources other than wages, dividends, and interest, (2) either husband or wife itemizes deductions, (3) you claim the status of head of household or surviving husband or wife, (4) you claim retirement income credit, (5) you claim "sick pay" exclusion for an amount included in wages shown on this form, or (6) you claim deductions for travel, moving, transportation, or "outside salesman" expense.

Filing on Form 1040.—Form 1040 may be used by all taxpayers and is designed to report all types of income and deductions.

WAGE AND TAX STATEMENT 1965

Copy D—For employer

Type or print EMPLOYER'S identification number, name, and address above.

INCOME TAX INFORMATION			SOCIAL SECURITY INFORMATION	
Federal income tax withheld	Wages ¹ paid subject to withholding in 1965	Other compensation paid in 1965	F.I.C.A. employee tax withheld	Total F.I.C.A. wages paid in 1965
Type or print EMPLOYEE'S social security number →			¹ Before payroll deductions or "sick pay" exclusions. EMPLOYER: This copy is provided for your convenience in keeping your withholding records.	
Type or print EMPLOYEE'S name and address above.				

FORM W-2—U.S. Treasury Department, Internal Revenue Service

659-16-78703-1

TO EMPLOYER:

- Prepare this form for each employee (a) from whom income tax has been withheld during the year or (b) whose wages, for purposes of income tax withholding, exceeded the amount of one withholding exemption for any payroll period (even though no income tax was withheld).
 - Fill in—(a) Your identification number, name, and address.
 - The amount of income tax deducted and withheld. If no amount was deducted and withheld enter "None" or "0."
 - Total wages paid before any payroll deductions. Payments of "sick pay" and non-cash remuneration are considered wages. If an employer keeps the records described in section 7 of Circular E he may also enter amounts of excludable sick pay in the space adjacent to "Total F.I.C.A. wages paid in 1965." Any amount of sick pay shown in the space should be identified by the words "excludable sick pay."
 - Total amount of F.I.C.A. employee tax (not the employer tax) deducted and withheld, if any (but if there was an adjustment in 1965 increased by the adjustment for an over-collection or decreased by the adjustment for an under-
- collection). If F.I.C.A. wages were paid but no employee tax was deducted, enter "None" or "0."
- Total wages paid (before payroll deductions) subject to the Federal Insurance Contributions Act. Non-cash remuneration is considered wages. If not subject to F.I.C.A., enter "None" or "0." No F.I.C.A. wage entry need be made if (1) F.I.C.A. wages exactly equal the total wages for income tax withholding purposes, or (2) F.I.C.A. wages are \$4,800 and the total wages for income tax withholding purposes exceed \$4,800.
- The employee's social security number, name, and address.
- State and local government employers which have been assigned an identification number with the prefix 69 should also show this number.
- Give copies B and C to the employee (a) on or before January 31 following the calendar year if the employee is in your employ at the close of such year, or (b) within 30 days after the last payment of wages, if his employment is terminated before the close of such year.
- Forward copy A to the District Director of Internal Revenue in accordance with the instructions printed on Form 941.
- For further information see Circular E, Employer's Tax Guide.

EMPLOYEE'S WITHHOLDING EXEMPTION CERTIFICATE

Type or print full name _____ Social Security Number _____
 Home address _____ City _____ State _____ ZIP code _____

EMPLOYEE:
 File this form with your employer. Otherwise, he must withhold U.S. income tax from your wages without exemption.

EMPLOYER:
 Keep this certificate with your records. If the employee is believed to have claimed too many exemptions, the District Director should be so advised.

HOW TO CLAIM YOUR WITHHOLDING EXEMPTIONS

1. If SINGLE (or if married and wish withholding as single person), write "1." If you claim no exemptions, write "0" . . . _____
2. If MARRIED, one exemption each is allowable for husband and wife if not claimed on another certificate.
 (a) If you claim both of these exemptions, write "2"; (b) If you claim one of these exemptions, write "1"; (c) If you claim neither of these exemptions, write "0" . . . _____
3. Exemptions for age and blindness (applicable only to you and your wife but not to dependents):
 (a) If you or your wife will be 65 years of age or older at the end of the year, and you claim this exemption, write "1"; if both will be 65 or older, and you claim both of these exemptions, write "2"
 (b) If you or your wife are blind, and you claim this exemption, write "1"; if both are blind, and you claim both of these exemptions, write "2" . . . _____
4. If you claim exemptions for one or more dependents, write the number of such exemptions. (Do not claim exemption for a dependent unless you are qualified under Instruction 4 on other side.) . . . _____
5. If you claim additional withholding allowances for itemized deductions fill out and attach Schedule A (Form W-4), and enter the number of allowances claimed (if claimed file new Form W-4 each year) . . . _____
6. Add the exemptions and allowances (if any) which you have claimed above and write total . . .
7. Additional withholding per pay period under agreement with employer. (See Instruction 1.) . . . \$ _____

I CERTIFY that the number of withholding exemptions claimed on this certificate does not exceed the number to which I am entitled. 648-10-79061-1
 (Date) _____, 19____ (Signed) _____

1. NUMBER OF EXEMPTIONS.—Do not claim more than the correct number of exemptions. However, if you expect to owe more income tax than will be withheld, a smaller number of exemptions may be claimed or you may enter into an agreement with your employer to have additional amounts withheld. Note this if you have more than one employer, or if both husband and wife are employed.

2. ITEMIZED DEDUCTIONS.—See Schedule A (Form W-4) for instructions on claiming additional allowances based on large itemized deductions.

3. CHANGES IN EXEMPTIONS.—You may file a new certificate at any time if the number of your exemptions INCREASES.

You must file a new certificate within 10 days if the number of exemptions previously claimed by you DECREASES because:

- (a) Your wife (or husband) for whom you have been claiming exemption is divorced or legally separated, or claims her (or his) own exemption on a separate certificate.
- (b) The support of a dependent for whom you claimed exemption is taken over by someone else, so that you no longer expect to furnish more than half the support for the year.
- (c) You find that a dependent for whom you claimed exemption will receive \$600 or more of income of his own during the year (except your child who is a student or who is under 19 years of age).

The death of a wife or a dependent, does not affect your withholding until the next year, but requires the filing of a new certificate. If pos-

sible, file a new certificate by December 1 of the year in which the death occurs.

For further information consult your local District Director of Internal Revenue or your employer.

4. DEPENDENTS.—To qualify as your dependent (line 4 on other side), a person (a) must receive more than one-half of his or her support from you for the year, and (b) must have less than \$600 gross income during the year (except your child who is a student or who is under 19 years of age), and (c) must not be claimed as an exemption by such person's husband or wife, and (d) must be a citizen or resident of the United States or a resident of Canada, Mexico, the Republic of Panama or the Canal Zone (this does not apply to an alien child legally adopted by and living with a United States citizen abroad), and (e) must (1) have your home as his principal residence and be a member of your household for the entire year, or (2) be related to you as follows:

- Your son or daughter (including legally adopted children), grandchild, stepson, stepdaughter, son-in-law, or daughter-in-law;
- Your father, mother, grandparent, stepfather, stepmother, father-in-law, or mother-in-law;
- Your brother, sister, stepbrother, stepsister, half brother, half sister, brother-in-law, or sister-in-law;
- Your uncle, aunt, nephew, or niece (but only if related by blood).

5. PENALTIES.—Penalties are imposed for willfully supplying false information or willful failure to supply information which would reduce the withholding exemptions.



CAMPCRAFTERS, Inc.

Social Security No. _____

Weekly Time Ticket

Note This must be submitted not later than Tuesday following the week for which this report is made.

Employee's Name _____ Week ending _____

Day	From	To	Hours	Kind of Work Done	Bldg. (or area)
M					
T					
W					
T					
F					
S					

Total Hours _____ Rate _____ Total Amount _____

Quality of work: (Check)
Satisfactory _____ Approved by: _____ Appropriation _____
Unsatisfactory _____ Dept. Chm. _____
Work checked by: _____ Adm. Asst. _____

Maine's Business

Public Sale Of Valle's Stock Reveals Growth

By Frank Sleeper

When a family-owned corporation goes public (sells shares of its stock to the public), information about it becomes available which wasn't in the public domain before. Thus it is with Valle's Steak Houses which will shortly have 333,000 shares of its stock up for sale.

Donald D. Valle, founder of the firm, and his wife, Sue D. Valle, now own 1,144,585 shares of Valle's common stock or 79 per cent of the stock in the company. After the public sale, the two will own 72 per cent, or 924,685 shares, with the public owning 26 per cent, or 333,000 shares, including newly issued shares.

It's interesting to look at the record of Valle's earnings over the past five years. The record is a good one; there's no question about that. For the year ending March 31, 1954, earnings were 28 cents a share. For the next four years, those earnings were \$325,814 or 38 cents, 65 cents and 81 cents. Earnings for the year ending March 31, 1958, were \$940,365.

Valle's now operates nine steak houses under its name — in Maine, Massachusetts, Connecticut, Rhode Island and New York. It has fast service snack bar restaurants in Kittery and Portland. It also licenses the sale and distribution of salad dressings and condiments under the Valle's trade name.

THE COMPANY was founded in 1933 during the depths of the depression by Don Valle as a sole proprietorship and started with a neighborhood restaurant at Woodfords Corner, Portland. The firm was incorporated under Maine law in 1950, opened in Kittery in 1955, on Brighton Ave., Portland, in 1960 and moved out-of-state for the first time in 1960 at Newton, Mass. It has been expanding ever since.

Its nine large restaurants, have seating capacity for 8,200, stress uniformity of operations. Each is about the same inside and out. Future Valle's Steak Houses all will have seating capacities of about 1,000. The menu is standard for all units. The meals are moderately priced, aiming at a family trade. Most food is prepared in accord with Valle's standard recipes and there's an executive chef who supervises preparation and serving of the food in all the outlets.

Attention to such methods and procedures is intended to bring operating economies and allow patrons to find a uniform quality of foods and services at the Valle's spots. Centralized purchasing arrangements for the restaurants are maintained. This is true for meats, seafoods and supplies and equipment. Perishables are bought by each

restaurant manager as required at predetermined prices from local suppliers designated by the company.

Valle's does a lot of advertising. For the year which ended March 31, its advertising costs amounted to about \$300,000.

In 1960, Valle's started its own credit card system. For the year ending March 31, sales through use of credit cards were about \$1,420,000 with \$820,000 on Valle's credit cards and \$600,000 on American Express credit cards.

About 15 per cent of the company's sales come from liquor, six per cent from private parties and banquets and the other 79 per cent from food business.

For the year closing March 31, gross income by the steak houses was as follows: Kittery, \$1,172,922 or 8.9 per cent; Newton, Mass., \$1,828,644 or 13.8 per cent; Portland, \$1,637,463 or 12½ per cent; Braintree, Mass., \$1,785,765 or 13.6 per cent; Saugus, Mass., \$1,298,134 or 9 per cent; Andover, Mass., \$1,145,865 or 8.7 per cent; Hartford, Conn., \$2,374,837 or 18.1 per cent; and Warwick, R.I., \$1,391,217 or 10.6 per cent. The other 3.8 per cent of gross income came from snack bar and miscellaneous sources.

VALLE'S WILL keep expanding. It wants to find locations for from two to four new restaurants a year. Sites for such restaurants must be between four and six acres. The building for 1,000 costs about \$700,000 above the cost of land. Each restaurant requires \$325,000 to \$350,000 worth of furniture, fixtures and equipment.

It takes about 18 months from the start of negotiations to opening of a new unit. Valle's has entered into purchase agreements for land in Stratford and West Haven, Conn., for \$350,000. It has just opened in Albany and will open next month in Springfield, Mass.

As part of its continued expansion policy, Valle's is negotiating an agreement with a private real estate developer under which it will sell or lease to the developer parts of land it owns for construction of motels or motor hotels under the Valle's name.

The developed won't be required to accept and develop each site offered him by Valle's and may build motels using the Valle's name in locations not close to the restaurants. If, should happen, the developer will sell or lease, if available, enough land there for Valle's to build a restaurant. Valle's will be paid a certain percentage in royalties for use of its name in this connection.

How is money raised by the public sale of Valle's stock going to be used? Of the amount, about \$467,000 will retire bank loans made to finance equipment purchases about \$700,000 will be used to buy equipment for the two new locations and about \$350,000 will be used to buy the two new Connecticut spots.

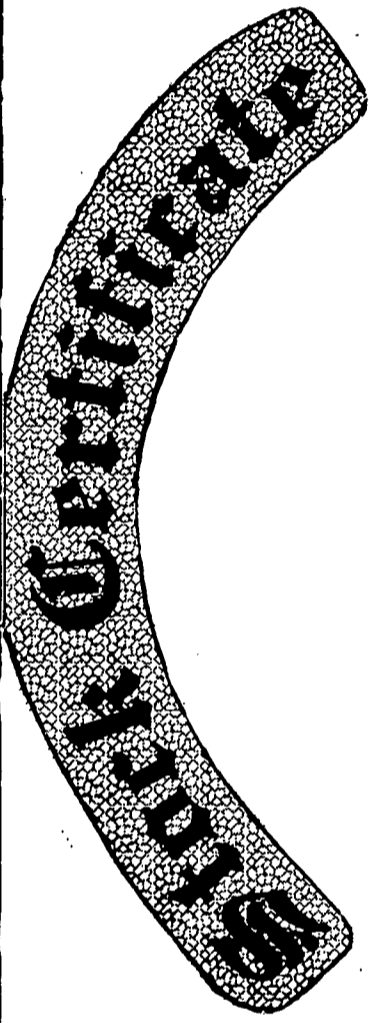
Whatever else you can say about Valle's, you have to say that this firm is really growing from its Maine birthplace.



NON-LEGAL
ONE SHARE
\$1.00
PAR VALUE

NON-TRANSFERABLE
CERTIFICATE NUMBER
No 0125

DATE _____



This Certifies That

_____ first name _____ initial _____ last name _____ number _____ street _____

_____ city _____ state or province _____ zip code _____ IS THE OWNER OF

ONE SHARE, PAR VALUE ONE DOLLAR, OF THE CAPITAL STOCK OF

GAMPORAFTERS, INC.

_____ city _____ state or province _____ SUBJECT TO INFORMATION ON THIS CERTIFICATE.

_____ company representative _____ stockholder

STOCKHOLDER VOTES FOR ELECTION OF BOARD OF DIRECTORS

PAY PERIOD ENDING _____ 19____
Camcrafters, Inc.

DATE _____ 19____ SOC. SEC. NO. _____

NAME			
REGULAR EARNINGS			
OVERTIME EARNINGS			
GROSS EARNINGS			
F. I. C. A.			EMPLOYEE'S STATEMENT OF EARNINGS AND DEDUCTIONS
WITHHOLDING TAX			DETACH BEFORE CASHING CHECK
TOTAL DEDUCTIONS			
AMOUNT THIS CHECK			

CAMPCRAFTERS, INC.
GORHAM, MAINE

No. 52-69
3214

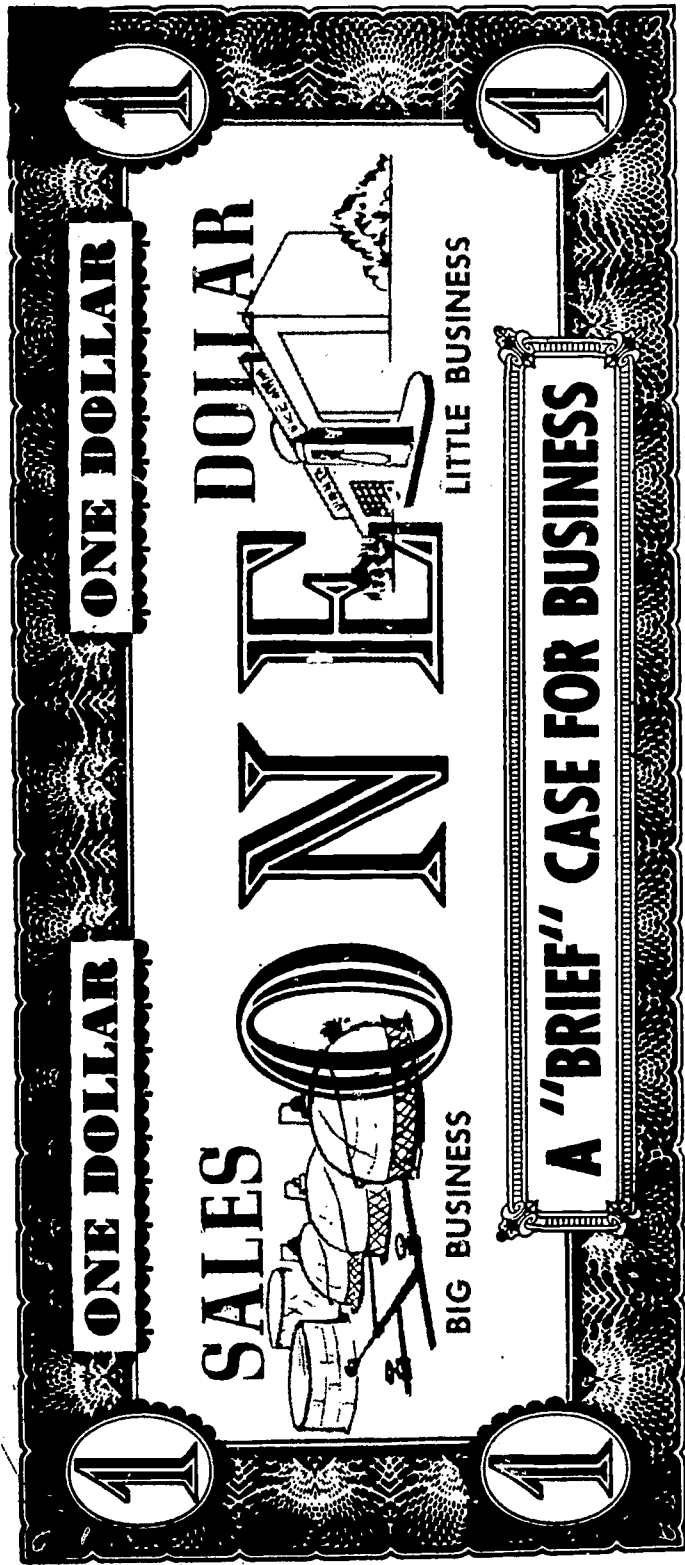
19____

DAY TO THE ORDER OF _____ \$ _____ DOLLARS

SAMPLE — NOT VALID

THE FIRST NATIONAL BANK

⑆3214⑆0069⑆ 987⑆654 3⑆



D I V I D E N D		L E F T	
T A X E S		W A G E S 26%	
T O O L S 3%		S U P P L I E S 58%	

Title: Functions and Activities of the Personnel Division of a
Corporate Manufacturing Industry

Presentation:

I. Employment - hiring

- A. Advertisement (want ads)
- B. Personnel of department
- C. Application for job
 - 1. Written
 - 2. Interview
- D. Job placement
- E. Forms used
 - 1. Record form
 - 2. Appraisal form

II. Job training

- A. Released time
- B. In plant
- C. Vestibule

III. Employee relations

- A. Social activities
- B. Problem counseling
- C. Safety

IV. Pupil activity

- A. Read want ad
- B. Fill out job application
- C. Be interviewed for a job
- D. Review interview through video tape
- E. Receive training for specific job in the manufacture of a product to be mass-produced

References:

Harold T. Amrine, et al, Manufacturing Organization and Management, Chapter 18

Teaching Aids:

Sample forms with transparencies

1. Want ad section of newspaper
2. Prepared want ad - "Campcrafters, Inc."
3. Application for employment
4. Record form
5. Appraisal form

Closed circuit television

Video tape recorder

HELP WANTED - MALE AND FEMALE

Campcrafters, Incorporated has located its new plant in the Gorham, Maine area. We have immediate openings for:

1 Quality Control Engineer

4 Line Foremen

10 General Production Employees

Union Shop, short hours, excellent fringe benefits. No experience necessary - - - we will train. If interested, see Mr. Knowles in Room 200A, Industry and Technology Center, Gorham State College, Gorham, Maine at 11 a.m. weekdays.

An Equal Opportunity Employer

APPLICATION FOR EMPLOYMENT

Print your name in full:

 Last First Middle
 Street address _____ Nearest telephone _____
 City _____ State _____ Soc. Sec. No. _____
 How long at this address? _____ Wages expected? _____
 Age _____ Date of birth _____ Height _____ Weight _____
 Ft., In. Lbs.
 Married _____ Single _____ Widowed _____ Divorced _____ Sex: M F
 Circle One

Number of children _____ List other dependents _____

Have you any physical defenctts? _____ If so, what? _____

Hobbies: _____

How many days have you lost by illness in the past two years? _____

Why are you seeking employment? _____

Were you ever employed by this company? _____

Names of friends or relatives working here _____

List names of employers you have had in the past five years and how long employed by each:

EDUCATION

	<u>Name of School</u>	<u>Location</u>	<u>Yrs. attended</u>	<u>Yrs. completed</u>
Grammar School	_____	_____	19 to 19	_____
High School	_____	_____	19 to 19	_____
Other education or Special Training	_____	_____	19 to 19	_____

I declare and warrant that the answers made herein are correct and true and that I am willing to undergo examination and to be fingerprinted.

Date _____ Signed _____

CAMPCRAFTERS, Inc.
Gorham, Maine

RECORD OF EMPLOYMENT

Campcrafters, Inc.
Gorham, Maine

Are you now employed? _____ If not, how long have you been unemployed? _____

Beginning with your last or present job, record below the complete details of your experience:

From	To	Employer	Address	Wage	Duties	Reason for leaving

MACHINE EXPERIENCE

Please check the two machines below with which you have the most experience:

Table Saw _____ Drill Press _____ Band Saw _____ Jointer _____ Shear _____
 Spot Welder _____ Surfacer _____ Jig Saw _____ Belt Sander _____ Wood Lathe _____
 Machine Lathe _____ Bench Grinder _____ Box and Pan Brake _____

What is the best job you ever had? _____

Employer _____ Address _____

Have you been in the Armed Forces? Yes ___ No ___

If so, give date: From _____ 19__ to _____ 19__ Rate or rank _____

Type of discharge _____

Applicant will not use this space

Remarks _____

Date _____ Signed _____

Accepted _____ Job _____

Rejected _____

CAMPCRAFTERS, INC.
Gorham, Maine

APPLICANT APPRAISAL FORM

To:

Applicant:

An application has been received from the individual whose name is given. We should appreciate your evaluation of this person's characteristics, ability and potential by completing this form. In particular, we should appreciate any comments you can provide at the bottom of this form, as such information is especially valuable. Your evaluation and comments will be held confidential.

It is important that the completed form be returned promptly so we may proceed with our consideration. A self-addressed envelope is enclosed for this purpose. Your cooperation will be most helpful and very much appreciated.

Please use as a basis for rating the comparison of this individual with all of the students with whom you have come in contact in your teaching (or working) career.

Yours very truly,

Director of Personnel

	No basis for rating	Poor	Fair	Average	Good	Superior
1. GENERAL APPEARANCE Neatness, grooming, posture, dress, physical appearance	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
2. SOCIAL IMPRESSION Social ease, speech and expression, mannerisms	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3. ABILITY TO GET ALONG WITH OTHERS Patience, open- mindedness, adaptability, respect for others	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. COMPETENCY Ability to learn easily, ability to apply knowledge and ideas readily, creativeness, ability to analyze and plan, accuracy, reliability	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. LEADERSHIP	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

COMMENTS:

Title: Functions and Activities of the Engineering Division of
a Corporate Manufacturing Industry

Presentation:

I. Product design (scientific method)

- A. Statement of problem
- B. Analysis and research
- C. Possible solutions
- D. Experimentation
- E. Final solution

II. Quality control

- A. Inspection
 - 1. Need for inspection
 - 2. Types of inspection
 - 3. Tools of metrology
- B. Failure
 - 1. Scrap
 - 2. Rework
- C. Prevention of poor quality
 - 1. Design prototypes
 - 2. Lab testing of prototypes
 - 3. Field testing

III. Tooling methods

- A. Hand
- B. Machine
- C. Automation

IV. Plant maintenance

- A. Types of responsibilities
- B. Types of maintenance
 - 1. Machines and equipment
 - 2. Housekeeping

V. Work schedule

A. Need for schedules

B. Types of schedules

1. Long range
2. Short range

VI. Student activities

A. Select a new product to be produced

B. Develop prototype for new product

C. Develop a work schedule to make product

References:

Amrine, Ritchey, Hulley, Manufacturing Organization and Management, Prentice-Hall, Chapter 18.

Anderson, A. D., Designer's Notebook

Lindbeck, John, Design Textbook, Chapter 1

Teaching Aids:

Film, The Factory, How a Product is Made

Title: Basic Elements of Engineering Drawing

Note to instructor using this lesson:

The items in this lesson plan are not intended to be taught to any degree of depth. They are only listed here to give an idea as to the items that would be included in an overview of engineering drawing. The emphasis in this lesson should be placed on items I and IV.

Presentation:

I. Drawing is an international language

A. Accurate way of explaining an object

B. Has alphabet

1. Object line
2. Hidden line
3. Center line
4. Dimension line
5. Extension line
6. Break line

C. Combination of symbols develop a clear expression of an idea

II. Drawings have many forms

A. Pictorial

1. Isometric
2. Oblique
 - a. Cabinet
 - b. Cavalier
3. Perspective
 - a. One point
 - b. Two point

B. Orthographic projection

1. One view
2. Two view
3. Three view
4. Auxiliary view

C. Stretch out

D. Sketches

1. Free hand
 - a. Pictorial
 - b. Orthographic

III. Instruments of drawing

A. Drawing board or table

B. T-square

C. Triangles

1. 30-60 degree

2. 45 degree

D. Scales

1. Architects

2. Mechanical engineers

E. Pencils

1. Hardness - 9H, 6B

2. Types

a. Wood

b. Mechanical

F. Erasers

1. Pearl or ruby

2. Art gum

3. Erasing shield

G. Drawing set

1. Bow compass

2. Leg compass

3. Dividers

4. Inking pens

a. For circles

b. For straight lines

H. Miscellaneous tools

1. Protractor

2. Brush

3. Pencil pointer

4. French curves

5. Lettering tools

6. Tape

IV. Student Activities

A. Study working drawings

B. Make sketches of a simple project to be produced

1. Detail of pieces
2. Assembly of product

C. Make sketches of necessary jigs and fixtures to manufacture a product

References:

Groneman, C. H. and J. L. Feirer, General Shop, pp. 2-64

Olson, Delmar, Industrial Arts for the General Shop, pp. 11-47

Teaching Aids:

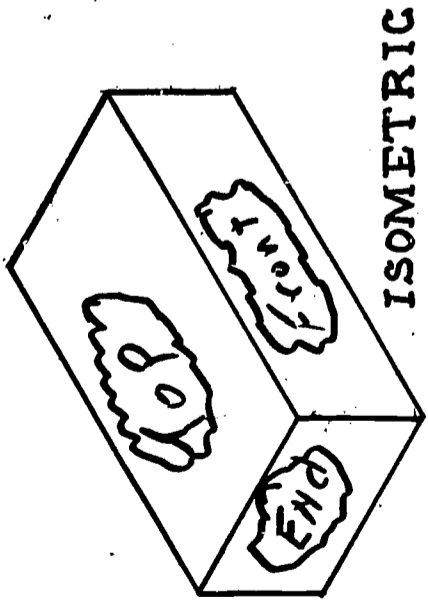
Closed circuit television

Transparencies of drawings for product

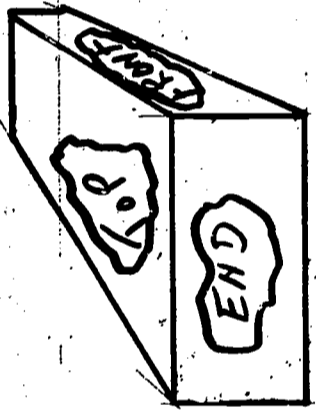
Information sheet: "How to Describe a Box with Engineering Drawing"

"Notes on Engineering Drawing"

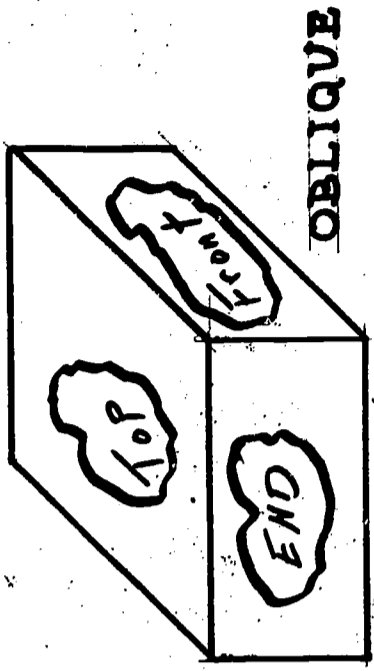
Drawing: A drawing developed and printed during lecture by team member using closed circuit TV



ISOMETRIC



PERSPECTIVE

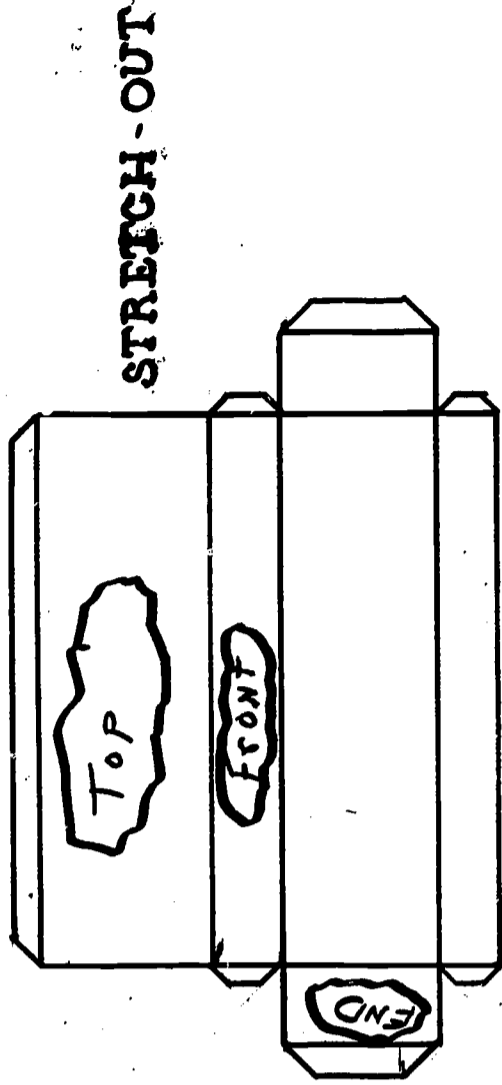


OBLIQUE

How To Describe A Box






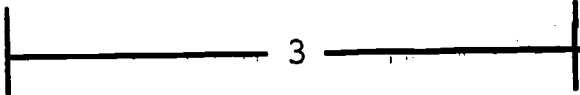
ORTHOGRAPHIC PROJECTION



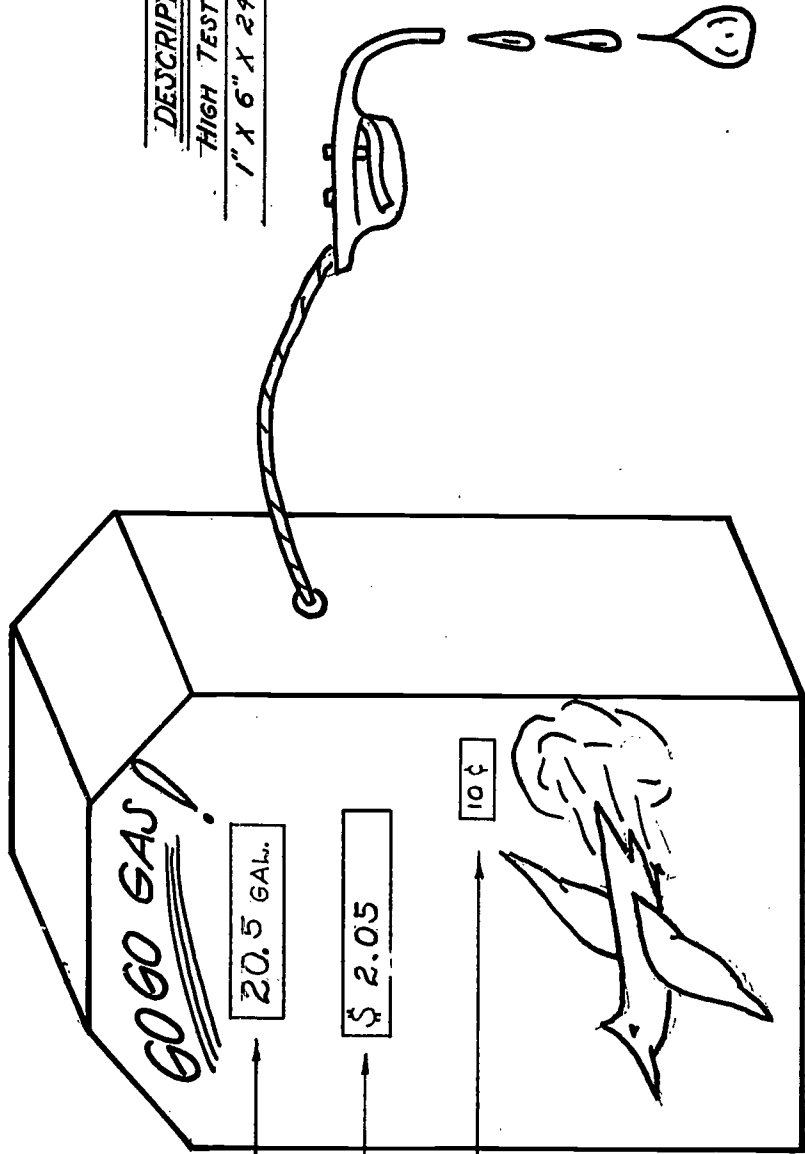
STRETCH - OUT

Using Engineering Drawing

SOME POINTS TO REMEMBER ABOUT ENGINEERING DRAWING AND SKETCHING

1. It is much easier to explain a product through a picture, sketch, or drawing.
2. Drawing is an international language that may be understood by anyone who knows the alphabet of lines and how to use it.
3. Accuracy in measurement is important to show the people who are to make the part exactly what is necessary to make the part.
4. The proper form of drawing should be selected to best show the product.
5. The basic alphabet of lines:
 - a. Object or visible line 
 - b. Hidden line 
 - c. Center line 
 - d. Dimension and extension line 
6. Drawing is necessary for all manufacturing work.
7. People who make drawings:
 - a. Engineers
 - b. Designers
 - c. Architects
 - d. Draftsmen
8. Sketching is freehand engineering drawing.
9. Neatness is very important when a drawing is made.
10. People who make drawings must take very good care of the tools that they use.
11. Blueprints are made from good drawings or tracings.

No Smoking
 IT COULD BE HAZARDOUS TO
 OUR HEALTH



TOTAL NO. UNITS

TOTAL

UNIT PRICE

DESCRIPTION	MAT.	TOTAL UNITS	UNIT PRICE	TOTAL
HIGH TEST		20.5 GAL.	.10 GAL.	\$ 2.05
1" X 6" X 2 1/2"	MAPLE	1 B.F.	.60 B.F.	.60

GROUP "3" G.S.C.

R. L. Sloan
Dr. J. L. Franklin
H. E. Farnham
John A. ...
Kenneth E. Olson

Janice Leavitt
Benny Briggs
Kristene Carpenter
Tamela Kirkpatrick
Shirley Ginn
Terrie Arthur
Nancy Dick
Alan Meadows
Matthew Skahan
Joseph K. Remsdell
Orson ...
Andrew Burt
Mark Beede

CAMPCRAFTERS INC. GORHAM, ME.

SCALE: FULL

DRAWN BY: SNOOPY

REVISED: NEVER

DATE: 2-25-68

APPROVED BY: BIG WHITE BIRD

DRAWING NUMBER: #007

Title: Functions and Activities of the Production Division of a
Corporate Manufacturing Industry

Presentation:

I. Purchasing

A. Bill of material

1. How used
2. Why used
3. Forms used

B. Sources of material

C. Units of purchasing; e.g., board foot, lineal foot,
square foot, lbs., etc.

D. Types of material

1. Raw
2. Finished
3. Sub-assembly

E. Incoming material inspection

II. Production planning

A. Need for

B. Types of

1. Long range
2. Short range

C. Personnel

D. Forms used

III. Production

A. Parts manufacturing

B. Sub-assembly

C. Final assembly

D. Finishing

E. Quality control and inspection

1. Rework
2. Reject

F. Testing

1. In laboratory
2. In field

G. Packaging

1. Types of packages
2. Tools of packaging

IV. Student activity

- A. Develop bill of material
- B. Figure cost of a product
- C. Manufacture and package a product

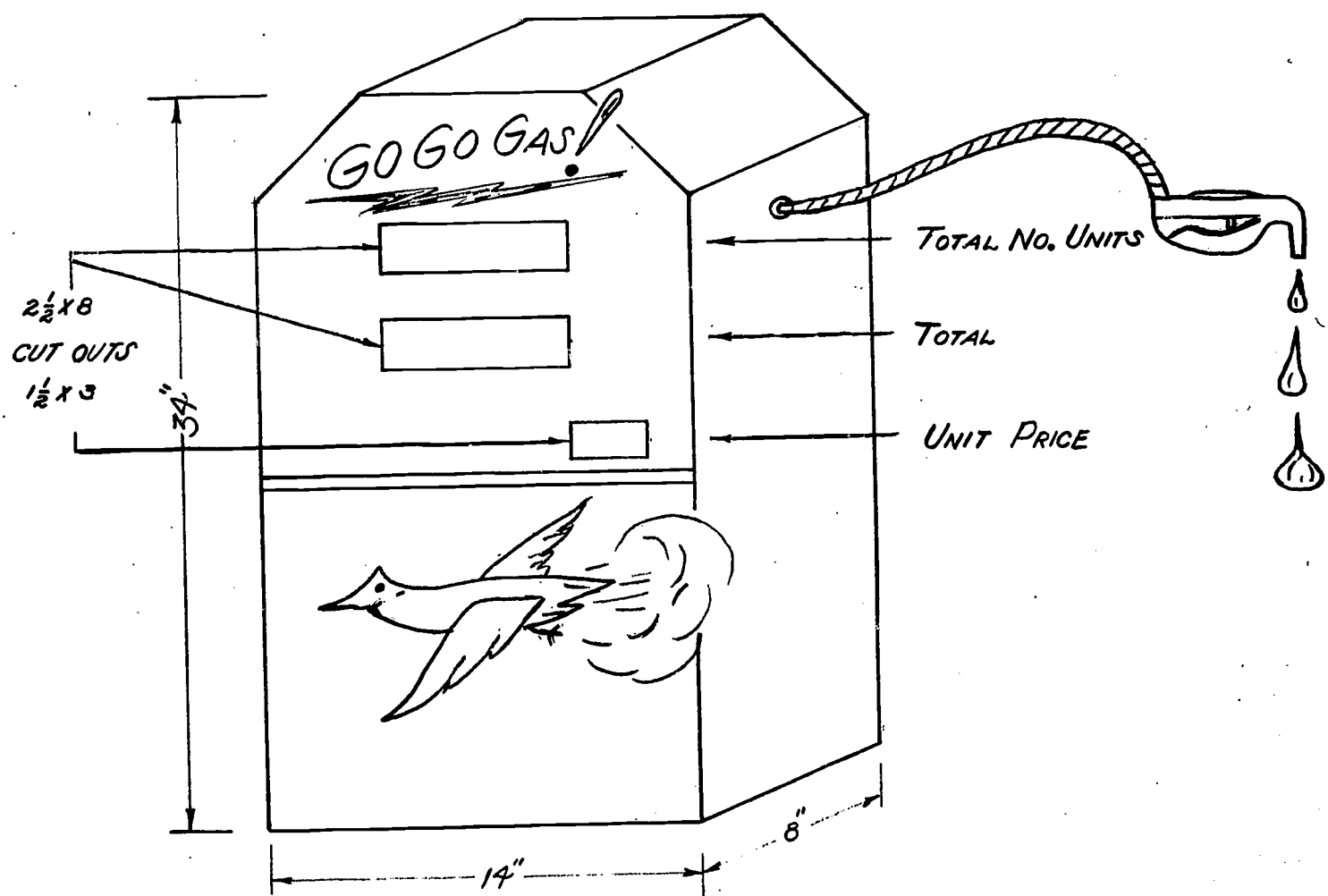
References:

- Haws and Schaefer, Manufacturing in the School shop, pp. 19-35
- Delmar W. Olson, Industrial Arts and Technology, pp. 100-149

Teaching Aids:

1. "Gas Pump," blackboard tool
2. Form for bill of material

BLACKBOARD VISUAL AID



THIS AID WAS DESIGNED TO RELATE GASOLINE PURCHASING TO A STUDENT'S "BILL OF MATERIALS".

MADE FROM $\frac{1}{4}$ " PLYWOOD, IT CONTAINS THREE CUT-OUT HOLES TO ENABLE WRITING THROUGH ONTO THE BLACKBOARD.

IT WAS PAINTED IN ATTRACTIVE COLORS TO GIVE THIRD DIMENSION APPEARANCE. A HOSE AND SPOUT CAN BE DRAWN ON THE BLACKBOARD WITH CHALK.

COST ANALYSIS OF A PRODUCT

STOCK BILL						
PART	NO. PCS.	DESCRIPTION	MTLS.	NO. UNITS	UNIT COST	TOTAL
TANG	1	$\frac{1}{8} \times \frac{1}{2} \times 10"$	BAND IR.	10"	$\frac{12}{\text{LIN. FT.}}$	
BLADE	1	3" x 6" - 20 GA.	STAIN. IRL.	$\frac{1}{8}$ S.F.	1.10	.14
HANDLE	1	1" x $\frac{1}{8}$ " x 6"	BLACK WALNUT	$\frac{1}{6}$ B.F.	1.00	.06
HARDWARE	2	$\frac{1}{8} \times \frac{1}{4}$ POP RIVETS	ALU.	2	.02	.04
	3	$\frac{1}{8} \times 1"$ ROUND HD. RIVETS	ALU.	3	.01	.03
FINISHING		ABRASIVES & OTHER MTL'S.				.08
WELDING						
ELECTRICAL						
TOTAL MATERIALS						.45

LABOR, TAXES, LIGHTS & POWER, TRANS., RE-WORK, etc. .225

PACKAGING, SALESMEN, ADVERTIZING (OVERHEAD) 50% .225

FACTORY WHOLESALE PRICE .675

MIDDLEMAN OR RETAIL MARKUP 40% .27

PRODUCT TURNOVER AFFECTS MARKUP
AS WELL AS VOLUME & SINGLE UNIT SALES

SUGGESTED CONSUMER PURCHASING PRICE 95¢

FOREIGN IMPORTS &

LOCAL COMPETITION CAN AFFECT RETAIL PRICE

Title: Development, Organization and Function of Unions

Presentation:

I. Early development of unions

- A. Need for union
- B. Organization of early unions
- C. Operation of early unions

II. Organization of modern unions

- A. Leadership
- B. Rank and file

III. Functions of modern unions

- A. Wages
- B. Working conditions
- C. Legislation
- D. Education

IV. Strikes and other types of work stoppage

A. Reason for strike

- 1. Wages
- 2. Conditions of work
- 3. Discipline

B. Types of work stoppage

- 1. Called strike
- 2. Wild-cat strike
- 3. Sit-down strike
- 4. Lock-out
- 5. Boycott
- 6. Work slowdown

V. Operation of a union

- A. Adopt constitution
- B. Elect officers
- C. Hold meetings
- D. Establish an office

- E. Keep records
- F. Negotiate contract

VI. Terminology of unions

VII. Pupil activity

- A. Organize a union
- B. Negotiate union contract

References:

Building Service Employees' International Union, Your Union

AFL-CIO, The Vital Link, 1964.

Commissioner of Labor and Industry, Labor Laws of Maine,
Augusta, Maine, 1965

Amrine, Ritchey, Hulley, Manufacturing Organization and
Management, Chapter 19

Teaching Aids:

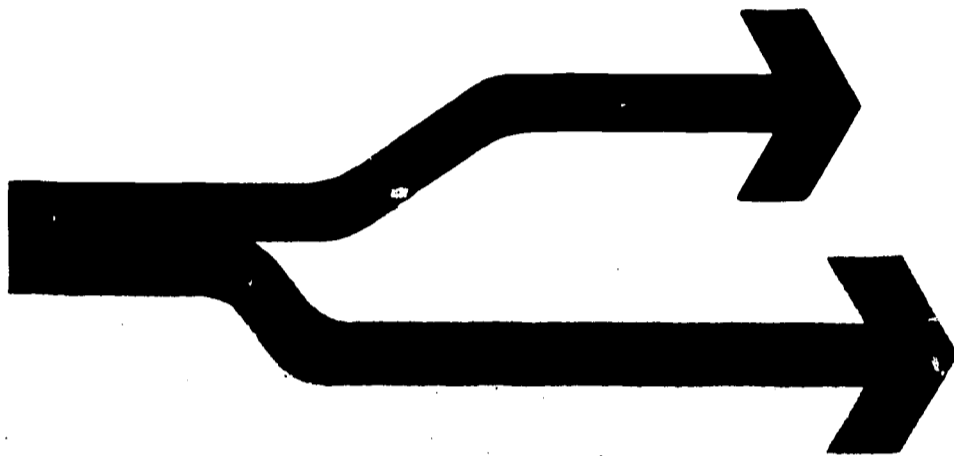
Teaching team form picket line using strike placards:

1. "Campcrafters, Inc., Unfair to organized labor"
2. "Campcrafters, Inc., Refuses to recognize union"
3. "Campcrafters, Inc., Employs scab labor"
4. "International Camp Equipment Workers - AFL-CIO"
5. "On Strike, ICEW AFL-CIO"

Pass-out sheets with overhead transparencies:

Organizations of unions (3)
Language of unionism

The Language of Unionism



CHARTER

An official document through which an international union establishes a local union and gives to it rights and duties under the international union's constitution.

CHECKOFF

The system under which the employee directs the employer to deduct union dues from his wages and turn them over to the union.

CITY CENTRAL

An organization of AFL-CIO local unions within the city or county. Also called "federated trades council," "central trades and labor council," or "central labor union."

CIC

The Canadian Labour Congress. The national organization that speaks for the labor movement in Canada.

COLLECTIVE BARGAINING

Negotiations between union and employer in order to determine terms and conditions of employment.

COMPANY UNION

An organization—not properly a union—of the employees of a given employer, who generally "runs" the company union from behind the scenes. Such a group is generally unaffiliated with other unions.

CONCILIATION

The effort to settle a dispute between union and employer through the services of a disinterested person. Unlike an arbitrator, a conciliator (or mediator) does not make a decision in the dispute but merely tries to bring the parties to agreement. Used synonymously with "mediation."

CONTRACT See "Agreement."

COPE

The Committee on Political Education of the AFL-CIO established to educate about political issues, support the best candidates for public office, and encourage voting.

AFL-CIO

The American Federation of Labor and Congress of Industrial Organizations. The national organization that speaks for the labor movement in the United States.

AGREEMENT

A binding contract entered into by union and employer for a specified period of time. It defines the relations between them, spells out the terms and conditions of employment, and describes the procedures to be used in settling disputes during the term of the agreement.

AFFILIATION

The membership of a local union in some kind of grouping of local unions, such as an international union or a state federation.

ARBITRATION

The process of permitting an impartial judge or arbitrator to settle a dispute between union and employer.

AUTOMATION

A loosely used term generally intended to refer to the replacement of the human worker by machinery—as the elimination of the elevator operator by the automatic elevator.

BOYCOTT

The refusal of a group of people, such as a union or a consumer's organization, to purchase the products of a particular company.

BUSINESS AGENT

An employee of a local union who organizes the unorganized and helps negotiate agreements and settle grievances.

CERTIFICATION

An official order of a labor relations board designating a local union as the collective bargaining agent for a specific group of employees.

DUES

Regular monthly contributions which members pay to cover costs of operating their union.

ESCALATOR CLAUSE

A provision in a union contract which ties the wage rate, or a part of it, to changes in a "cost-of-living" measure, such as the Consumer Price Index.

FEDERAL LABOR UNION

A local union affiliated directly with the AFL-CIO, not through an international union.

FREE LOADER

A worker who benefits from unionism but refuses to pay his share of the cost (that is, his dues).

"FRINGE" BENEFITS

Non-wage benefits, such as paid vacations and health insurance, won from employers through collective bargaining.

GRIEVANCE

Employee dissatisfaction with some aspect of his job. "Grievance Procedure" in the contract describes how union and management attempt to alleviate such dissatisfaction.

ICFTU

The International Confederation of Free Trade Unions.

INDEPENDENT UNION

A weak union not affiliated with a federated organization like the AFL-CIO. So-called "independent" unions often are, or become, company dominated.

JURISDICTION

The occupations, industries, and area in which a union, through its charter, has been assigned to organize.

JOINT COUNCIL

A cooperative grouping of unions, for example Building Service unions, within a specified geographical area.

LABOR RELATIONS BOARD

The state or federal agency which certifies unions, rules on unfair labor practices, and defines appropriate bargaining units when called upon to do so.

LANDRUM-GRIFFIN

This 1959 revision of the federal labor relations law continues, and makes even more severe, most of the objectionable provisions of the Taft-Hartley Act. It substantially increases the reporting and record-keeping burden on unions and is discriminatory and unfair to the trade union movement.

LOCAL UNION

An organization of wage-earners, usually in specified occupations and industries and within a specified locality, designed to unite the economic power of its members for the purpose of bargaining collectively with the employer or his spokesman.

LOCKOUT

A withholding or shutting down of work by an employer in order to force employees to accept his terms.

MAINTENANCE OF MEMBERSHIP

A kind of union security provision which requires those employees who are members of the union to remain members for the duration of the contract.

MEDIATION

See "Conciliation."

MINIMUM WAGE LAW

Legislation which provides that workers must not be paid less than a certain wage. Both the states and the federal government have minimum wage laws, but many workers are not covered.

NATIONAL LABOR RELATIONS BOARD

See "Labor Relations Board."

OPEN SHOP

A place of employment where workers are employed regardless of whether or not they are union members. (So-called "open shops," however, are generally "closed" to union members.)

STRIKE

A withholding of labor in order to protest a grievance or to enforce a demand for better wages and working conditions.

TAFT-HARTLEY

The 1947 revision of the federal labor relations law, still in effect today. While dressed up to resemble its predecessor (the Wagner Act), Taft-Hartley is aimed at hampering and destroying unions. Strong unions, high industry profits, and labor shortages have kept employers from making the fullest use of this vicious anti-labor weapon.

UNION LABEL

A small label attached to manufactured articles in order to inform prospective buyers that the article was produced by union workers.

UNION SECURITY PROVISION

Clause in an agreement which defines the rights of the union as an organization. Examples are union shop, closed shop, and maintenance-of-membership provisions.

UNION SHOP

An agreement between union and employer which requires all employees to remain members of the union, and those hired to become members.

WELFARE PROVISION

A clause in a union-employer agreement in which the employer agrees to provide pensions, life or hospital insurance, or some other kind of assistance to employees during periods of sickness or retirement.

WILDCAT STRIKE

A strike called by union members or other workers without the sanction of the union.

WITHDRAWAL CARD

The card given to a member who voluntarily leaves the union. It shows that he or she was in good standing while a member.

PER CAPITA TAX

The regular monthly affiliation fee paid to a "parent" organization by a union for each of its members.

PICKETING

The act of walking back and forth (by members of a local union) before the place of work with which the union is in dispute and informing the public that a dispute exists.

"RIGHT-TO-WORK" LAW

A misnamed type of state law which guarantees no one the right to work, but only keeps unions from negotiating union shop contracts. Such laws are aimed at destroying unions by attempting to cut down their funds.

SCAB

An employee who continues to work during a strike. Also, a person who accepts work in a building or other place of employment where a strike exists.

SENIORITY

An employee's standing on a list based on length of service on the same job or with the same employer.

SEVERANCE PAY

An addition to regular wages, which is paid to an employee whose employment is terminated through no fault of his own.

SHOP CARD

A prominently-displayed sign by which employers indicate to the public that their employees are covered by an agreement with a BSEIU local union.

STATE FEDERATION

The state-wide association of AFL-CIO local unions, organized chiefly for purposes of presenting a solid front before the state legislature.

STEWARD

Also called shop steward. An employee elected or appointed by the union to assist union members in getting their grievances remedied.

BSEIU

**BUILDING SERVICE EMPLOYEES
INTERNATIONAL UNION (AFL-CIO)**

900-17th Street, N.W.

Washington 6 D.C.

DAVE SULLIVAN

GEORGE L. ...

THOMAS J. BARKO

CHARLES ...

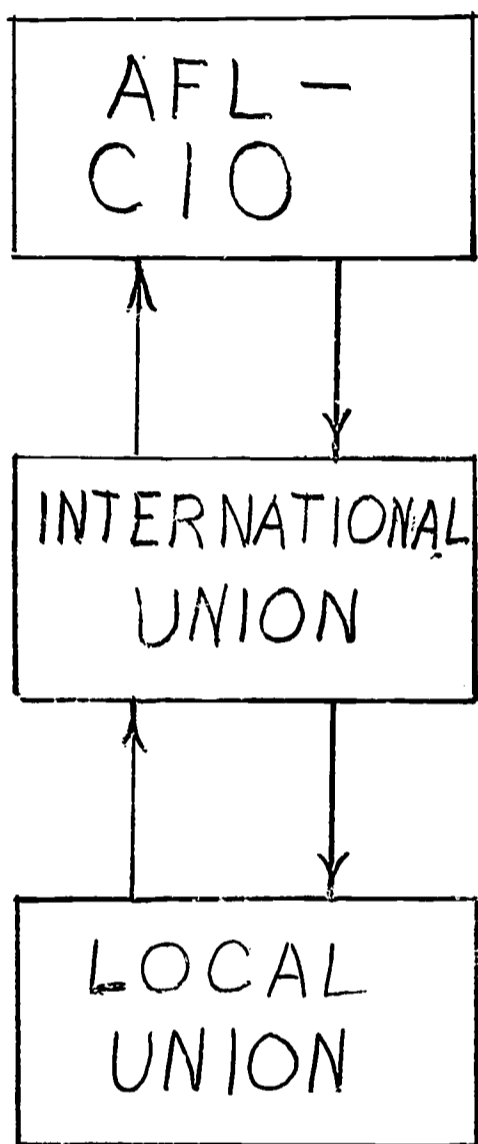
THOMAS ...

GEORGE ...

ALBERT G. HOGG

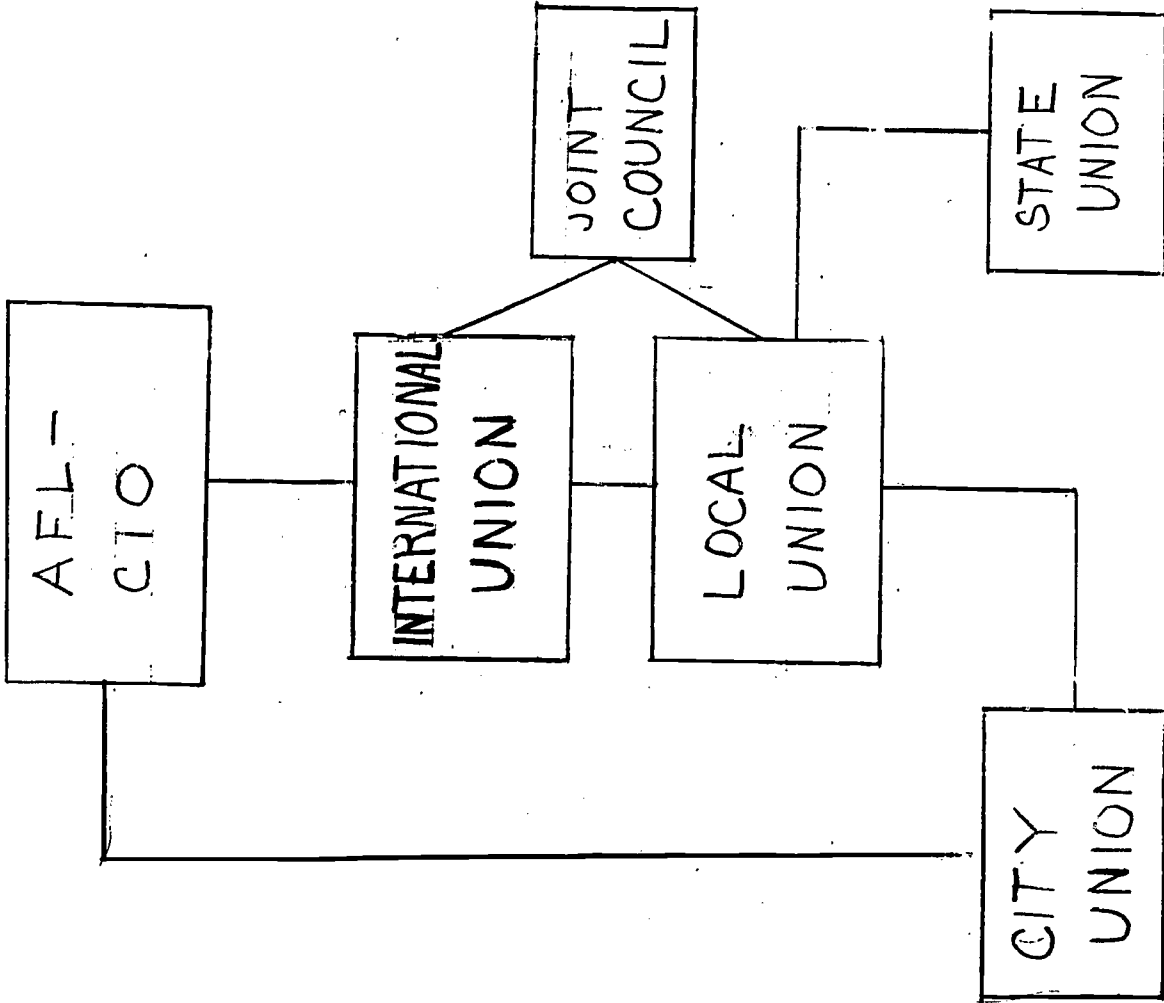
HENRY A. ...

RELATIONSHIP OF UNION ORGANIZATIONS

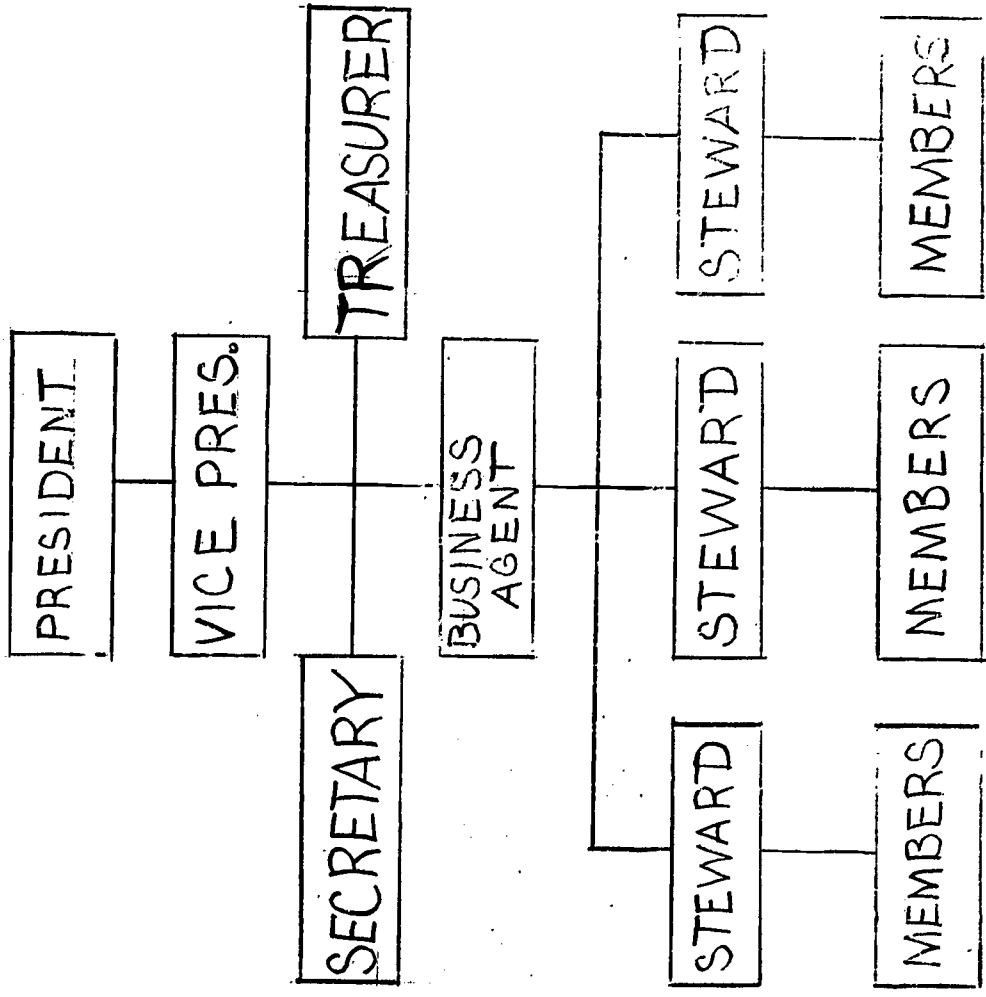


AFL - AMERICAN FEDERATION of LABOR
CIO - CONGRESS of INDUSTRIAL ORGANIZATIONS

RELATIONSHIP of UNION LEADERSHIP



ORGANIZATION of LOCAL UNION



RANK and FILE

Campcrafters
Inc.

UNFAIR

TO

ORGANIZED

LABOR

~~~~~

Campcrafters  
INC.

EMPLOYEES

SCAB

LABOR

Campcrafters  
Inc.

REFUSES!

TO

RECOGNIZE

UNION





**ON STRIKE**

---

International

Camp

Equipment

Workers

AFL - CIO

I I I

**ON  
STRIKE!**

*ICEU*

**(AFL  
CIO)**

Title: Safety in Industry and the Laboratory

Presentation:

Note: Safety becomes an integral part of all tool, machine and process lessons. It should be taught in these lessons when applicable.

- I. Needs for safety
- II. Organizations of safety
  - A. National Safety Council
  - B. Red Cross
  - C. Insurance companies
- III. Common safety precautions
  - A. Rules of conduct
  - B. Devices
    - 1. Goggles
    - 2. Shields and guards
    - 3. Ventilation
    - 4. Fire
      - a. Extinguishers
      - b. Fire drills
      - c. Precautions
  - C. First aid
    - 1. Training
    - 2. Where to receive
- IV. Safe condition of tools and machines
- V. Safe plant conditions
  - A. Floor and benches
  - B. Safety zones, color coding
  - C. Material storage, product storage
- VI. Transportation safety
  - A. In plant
  - B. Out of plant

References:

Amrine, Ritchey, Hulley, Manufacturing Organization and Management, pp. 352-357.

Cunningham and Holtrop, Woodshop Tool Maintenance, pp. 39-45

Groneman and Feirer, General Shop

Title: Maintenance Procedures

Presentation:

I. Definition - basic methods of daily preventive care of tools and machines to keep them in safe working order

II. Principles

A. Tools arranged on panels according to use

1. To prevent loss, return to proper place
2. Arranged to prevent damage

B. For safety reasons must be checked each time used

III. Organization

A. Group works under simple personnel system for a clean place to work

B. Machines and tools should have periodic maintenance

1. Oiling
2. Sharpening
3. Cleaning
4. Polishing

IV. Pupil activities

A. Return tools to panels as soon as possible after use

B. Demonstrate simple maintenance procedures on tools, machines, and equipment; e.g., oil, wipe, wax polish, clean, etc.

C. Participate in clean-up operations in the laboratory

References:

Beryl M. Cunningham, etal, Woodshop Tool Maintenance,  
Chapters 2 and 20

Title: Common Cutting Processes

Presentation:

I. Definition: The process of removing material and changing its size or shape

II. Demonstrate the following tools:

A. Auger bit - used for boring holes in wood

1. Bore until point comes through or use backing piece
2. Size marked by number 10, 11, 12, etc., meaning 10/16, 11/16, 12/16, etc.

B. Countersink

1. Enlarges surface portion of hole to take flathead screw
2. Types for wood, metal, and other material

C. Drill bit, twist - used for drilling holes in materials; e.g., wood, plastic, metal, etc.

D. Back saw - used to cut across the grain of wood to obtain a smooth, fine cut

E. Hack saw - used for cutting materials; e.g., metal and plastics

F. Files

1. Shapes: flat, half round
2. Cut: single and double, aluminum file

G. Bolt cutter - used for cutting small round rod, bar stock, square stock, hex stock

III. Machines used for cutting

A. Squaring shear

1. Used for cutting sheet materials
2. Handle operated by hand to cut material
3. Guide on side to hold material square
4. Guide on back to cut a number of pieces to the same size.

B. Delta pattern tracer (wood lathe)

1. Bolted to bed of lathe
2. Tool operated by hand to follow a pattern

C. Belt sander with table

1. Material held square by hand and pushed against belt
2. Coarseness of paper and pressure determines speed of cut and smoothness

IV. Safety

A. Hand tools

1. Handle all cutting tools with care, they have sharp points and edges
2. Do not carry tools in your pockets or carry too many at one time
3. When through with a tool, return it to its proper place

B. Machine tools

1. Be careful of sharp edges
2. Keep fingers clear
3. Only one person at a machine at a time
4. Wear goggles
5. Never leave a power machine running when not in use

V. Pupil activities

A. Select and return tools to proper place

B. Use the proper cutting tools to manufacture a product

References:

Chris H. Groneman and John L. Feirer, General Shop, Section 1-4

Teaching Aids:

The tools listed

Title: Common Forming Processes

Presentation:

I. Definition: The changing of the shape or form of an object by stretching, bending, twisting, etc., without removing material.

II. Show and demonstrate the following forming and shaping tools:

A. Anvil - a block of iron or steel used for bending metal and shaping heated metal

B. Ball peen hammer

1. Used for bending metal
2. Used for forming metal
3. Used for forming rivets

C. Riveting hammer - used for heading rivets

D. Claw hammer - used for setting and drawing nails

E. Carpenter's mallet - used for shaping and forming material; prevents marring surface

F. Plastic soft-faced mallet - used for same processes as carpenter's mallet

G. Rivet set - used to draw and form the head of a rivet

H. Box and pan brake - used for bending sheet metal

I. Vise - used to hold material while it is shaped

III. Safety with forming tools

IV. Pupil activities

A. Pick up and return tools to proper place

B. Use tools to manufacture a product

References:

Chris H. Groneman and John L. Feirer, General Shop, Sections 1-4



Title: Common Layout Processes

Presentation:

- I. Layout tools - used to measure and layout the correct size and shape
- II. Hand layout (those processes needed)
  - A. Show common tools on laboratory tool panel and demonstrate use
    1. Sliding T-bevel - for marking angles
    2. Outside calipers - measuring device used for checking diameters
    3. Bench rules (wood and steel) - for measuring and marking materials
    4. Sheet metal gauge - for measuring thickness of sheet metals
    5. Center punch - for starting a drill
    6. Prick punch - for marking points
    7. Combination square
      - a. For perpendicular lines
      - b. Check and drawing an angle
      - c. Finding the center of round stock
    8. Tri-square - for perpendicular lines
    9. Scriber - for marking lines, primarily on sheet metal
    10. Scratch awl - for scratching lines
    11. Pencil and chalk - for marking lines

- B. Care of layout tools

1. Precision tools
      2. Return to proper place

- III. Safety

- A. Do not carry in pockets
  - B. Return to proper place
  - C. Use only for jobs for which they have been designed

- IV. Pupil Activity

- A. Select and return tools to proper place
  - B. Use proper layout tools to manufacture a product

Reference:

Chris H. Groneman and John L. Feirer, General Shop, Section 1-4

Title: Common Holding Processes

Presentation:

I. Definition: A tool or machine used to hold your material while it is being worked on

II. Processes

A. Jigs - used to hold the workpiece and guide the tool for cutting. Many pieces can be cut identically with a jig.

B. Fixture - used to hold the workpiece only. The tool is guided by the machine used.

C. Clamping - using clamps, vises, etc. to hold your work for cutting, forming, or shaping.

III. Holding tools

A. Hand drill - used for holding drill bits for boring holes

B. C-clamp

1. A general-purpose clamp
2. Holding material face to face

C. Hand screw clamp - for general clamping

D. Vise-grip wrench - can be locked onto the material being worked

E. Drill press vise - especially designed to use on the drill press

F. Wood vise - designed to hold soft materials

G. Machinist vise - designed to hold metal, primarily

IV. Safety

A. Use properly

B. Keep in good repair

V. Student activities

A. Locate and name the holding tools and machines he will use in the manufacture of a product

B. Demonstrate safe use of each tool used for holding

C. Use holding tools in the manufacture of a product

References:

Georgia Department of Education, Industrial Arts for the Middle Grades, pp. 75-79

Chris H. Groneman and John L. Feirer, General Shop, Section 1-4

Teaching Aids:

Sample jigs and fixtures

Title: Common Finishing Techniques

Presentation:

- I. Definition - materials used to protect and beautify products
- II. Techniques
  - A. Polishing - removal of dulling surface factors to beautify the product
  - B. Sanding - the procedure for smoothing materials in preparation for applying finishing material
  - C. Dip finish - dip wood parts into penetrating-type finish and wipe dry
- III. Safety
  - A. Protect eyes
  - B. Clean hands and work area
- IV. Student activities
  - A. Locate and name the finishing tools and procedures he will use in the manufacture of a product
  - B. Demonstrate safe use of each tool used for finishing
  - C. Use finishing tools in the manufacture of a product
  - D. Use finishes on the product he is to manufacture

References:

Adnah C. Newell, Coloring, Finishing and Painting of Wood,  
Chapters 19-20

Title: Common Assembly Techniques

Presentation:

I. Definition: putting together all parts that have been manufactured

II. Techniques

A. Pop riveting

1. Special tool used
2. Special rivet for soft material
3. For light work

B. Peened riveting

1. Slower than pop riveting, but stronger
2. Rivet set and ball peen hammer used for forming head

C. Force fit

1. Hole slightly smaller to receive male part
2. Used for handles, drive pins, etc.

III. Safety

A. Keep tools in good condition

B. Watch your fingers

IV. Student activities

A. Locate and name the assembly tools he will use in the manufacture of a product

B. Demonstrate safe use of each tool used for assembly

C. Use assembly tools in the manufacture of a product

References:

Georgia Department of Education, Industrial Arts for the Middle Ages, pp. 59-62

Chris H. Groneman and John L. Feirer, General Shop, p. 201

Title: Functions and Activities of the Marketing Division of a  
Corporate Manufacturing Industry

Presentation:

I. Market Research

- A. Who and where the customer is
- B. What he needs
- C. What he wants
- D. What he will buy
- E. Where and how he will buy
- F. How much will he pay

II. Sales

- A. What advertising messages have greatest appeal
- B. Where should message be placed

III. Advertising

- A. Promotes a product
- B. Proper placement of advertisement

IV. Distribution

- A. Direct to user who may be an individual, a company,  
or another manufacturer
- B. Through wholesaler or jobber, who in turn sells to retailers  
or to other manufacturers

V. Service

- A. New product development
- B. Improvement of present products
- C. New uses for old products
- D. Competitive customer preferences
- E. Product elimination or simplification of lines
- F. Naming of product

## VI. Student Activities

- A. Examine packages for various products
- B. Develop a package for a product
- C. Develop an advertising display
- D. Develop a TV commercial
  1. Spoken
  2. Singing

### References:

Amrine, Ritchey, Hulley, Manufacturing Organization and Management, pp. 493, 499, 503, 507

### Teaching Aids:

Various packages and boxes for display

Pass-out sheet on marketing, with assignments

## MARKETING

### Student Activity Sheet

TOPIC: PACKAGING AND SELLING OF SPATULA

EXPLANATION: Well-planned marketing processes are a "Pathway to Profits" according to the General Electric Marketing Services Division.

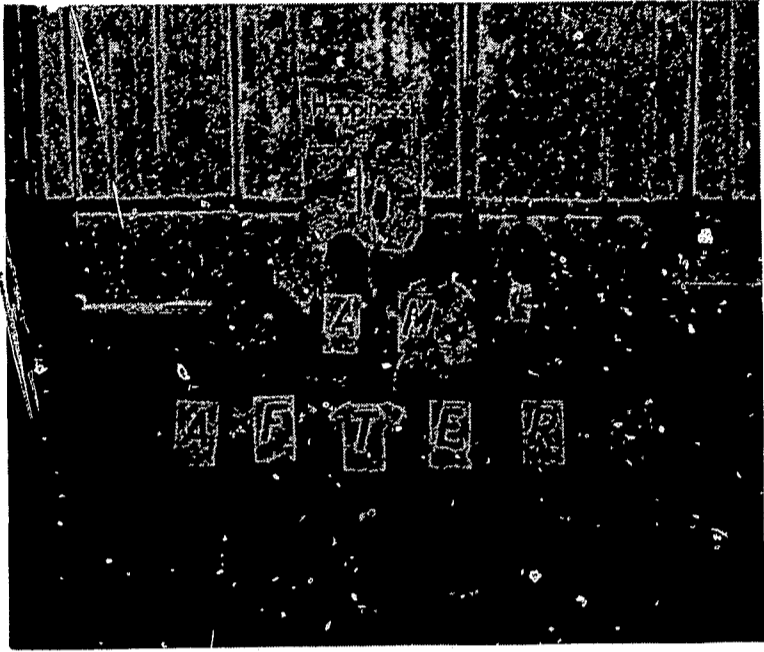
We, the Campcrafters, Inc. of Gorham State College, have a product to sell and we must make a profit if we are to remain in business. Through advertising, we will be able to promote our product and the potential buyer will gain the following information:

1. The fact that our product exists
2. Where our product can be purchased
3. What our product will do
4. Price of our product
5. How to care for our product
6. Expected durability (length of life) of our product

STUDENT ACTIVITY CHOICE: Select one of the following topics and prepare it to present to the Board of Directors of Campcrafters, Inc. on \_\_\_\_\_.  
Date

1. Prepare a script for a TV commercial to advertise our product.
2. Design an attractive (simple and inexpensive) package and label for our spatula.
3. Design, sketch, and color an attractive poster to promote the sale of our spatula.

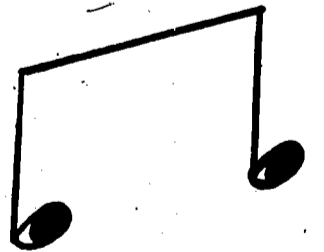




“ The Campers ”

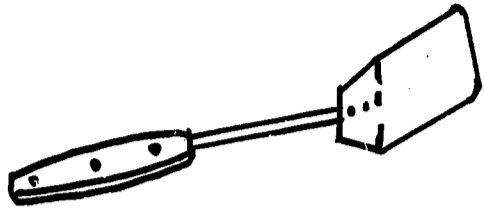
SINGING THEIR

Original  
LOONEY TOONEY



# CAMPCRAFTERS!

SUNG TO MICKEY MOUSE TUNE (CHORUS)



GSC



Musical notation for the first line of the chorus, featuring a treble clef, a key signature of one sharp (F#), and a 4/4 time signature. The melody consists of quarter and eighth notes.

Camp craft ers, Camp craft ers, For ever we will

Musical notation for the second line of the chorus, continuing the melody from the first line.

hold our ban-ners high, Come a long and listen To our

Musical notation for the third line of the chorus, continuing the melody.

gim micks here To day, C A M - P C R -

Musical notation for the fourth line of the chorus, concluding the melody with a double bar line.

A F T E R S .

GORHAM-LOONEY TOONEY

"ADVERTISING DITTY"

MICKEY MOUSE, MICKEY MOUSE,  
FOREVER LET US HOLD OUR BANNER HIGH.  
COME ALONG AND SING THIS SONG  
AND JOIN OUR JUBILEE  
M I C...K E Y...M O U S E

CAMPCRAFTERS, CAMPCRAFTERS  
FOREVER LET US HOLD OUR BANNER HIGH.  
COME ALONG AND LISTEN TO  
OUR GIMMICK HERE TODAY.  
C A M...P C R...A F T E R S

UNIT EVALUATION:

The following test items are suggested for a final test to aid in the evaluation of the pupils. The enclosed answer sheet is used for ease in grading.

EVALUATION of the pupils' understanding and participation in this unit of work shall be done in three ways:

I. Written tests and examinations (40%)

During the time that this unit is being taught, it is expected that short quizzes be given over specific lessons and outside readings and assignments. At the close of the unit, a final examination shall be given. These quizzes and the final test shall include objective as well as essay type questions so that all students will have equal opportunity to express their understanding of the material covered.

II. Laboratory and outside activities (40%)

During the course of this unit, there will be many varied opportunities for students to develop greater understandings and show creative talent through homework and laboratory assignments. These should be evaluated according to the student's demonstrated ability.

III. Class laboratory participation and social attitude development (20%)

One of the objectives of this unit is the development of proper attitudes about the pupil's place in the industrial technical society. The evaluation of this can best be done by the observation of the student as he relates to his fellow students. The instructor must be careful to make the evaluation of social attitude development as objective as possible, keeping in mind that it may be impossible not to let some subjective opinions sway his thinking.

## FINAL TEST

An answer sheet is provided with this test. Do not make any pen or pencil marks on the test itself. Be sure you fill out the information asked for at the top of the answer sheet.

**Multiple Choice:** Read the first part of the statement, then read all of the second parts (lettered) and select the one that best completes the statement. If you select "a," make a good heavy dot in the "a" column on your answer sheet after the proper number. If you select "b," "c," or "d," make a heavy dot in the proper column after the proper number. There is only one correct answer for each statement.

1. Workmen's compensation is paid for by:
  - a. The employer
  - b. The worker
  - c. The government
  - d. Both the employer and the employee
2. Social security is paid for by:
  - a. The employer
  - b. The Worker
  - c. The government
  - d. Both the employer and the employee
3. The line used to indicate the visible edges of working drawings is called:
  - a. Extension line
  - b. Center line
4. A product found by quality control to have a minor defect is set aside for:
  - a. Scrap
  - b. Rework
  - c. Packaging
  - d. Sale
5. A sharp tool is:
  - a. Dangerous
  - b. Pretty
  - c. Safe
  - d. None of the above
6. A device used to hold the workpiece while the tool is guided by a machine is called a:
  - a. Fixture
  - b. Jig
  - c. Chuck
  - d. Cutting tool

7. A drawing that is not a pictorial drawing is:
  - a. Isometric
  - b. Perspective
  - c. Oblique
  - d. Orthographic
  
8. The unit used for figuring the cost of lumber is:
  - a. Pound
  - b. Foot
  - c. Board foot
  - d. Square foot
  
9. The first person to whom a grievance is reported in a union shop is the:
  - a. Foreman
  - b. Shop steward
  - c. Personnel manager
  - d. President
  
10. A design is functional when it:
  - a. Is beautiful
  - b. Is unusual
  - c. Is new
  - d. Works well
  
11. The amount of income tax is determined by:
  - a. Percent of income
  - b. So much per person
  - c. Amount of personal property
  - d. Type of job
  
12. The aesthetic value of design refers to:
  - a. Long wearing quality
  - b. Appearance
  - c. Workability
  - d. Cost
  
13. A first line supervisor is the same as:
  - a. Manager
  - b. Shop steward
  - c. Foreman
  - d. Vice president
  
14. Which one of the items below does not fit the purpose of unions?
  - a. Better wages
  - b. Better working conditions
  - c. Company profit
  - d. Better retirement benefits
  
15. Tools on a panel should be arranged:
  - a. To prevent damage
  - b. By alphabetical order
  - c. By make of tool
  - d. By size

16. Which tool listed below is not a cutting tool?
- Auger bit
  - Hand drill
  - File
  - Hack saw
17. A ball peen hammer is a:
- Layout tool
  - Cutting tool
  - Holding tool
  - Forming tool
18. A tool or machine used to hold material while it is being worked on is called a:
- Cutting tool
  - Finishing tool
  - Forming tool
  - Holding tool
19. A product schedule is used to:
- Assure the product is completed on time
  - Prevent damage
  - Prevent a safety hazard
  - Figure cost
20. Want ads tell a person:
- What questions to ask when applying
  - Which companies are reliable
  - Companies not to work for
  - The jobs available
21. The stockholder holding the majority of shares in a company:
- Has controlling interest
  - Pays the bills
  - Is the president
  - Orders all materials
22. A normal working day is from 8 a.m. to 4:30 p.m. If one hour is taken for lunch and a 15 minute coffee break is used in the morning and also one in the afternoon, how much time is devoted to actual production?
- 7.5 hours
  - 7 hours
  - 6.5 hours
  - 6 hours



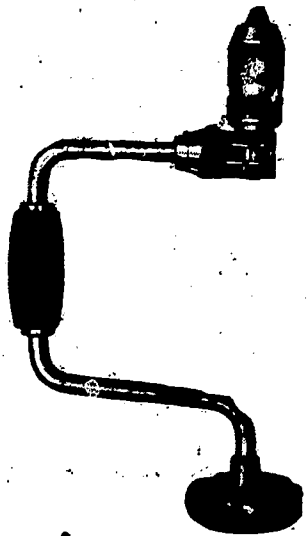
Final test: (cont'd)

**Matching:** Select the correct picture to go with the name after the number.  
On your answer sheet make a heavy dot in the proper column (a,b,c or d)  
after the proper number.

23. pop riveter

24. drill press

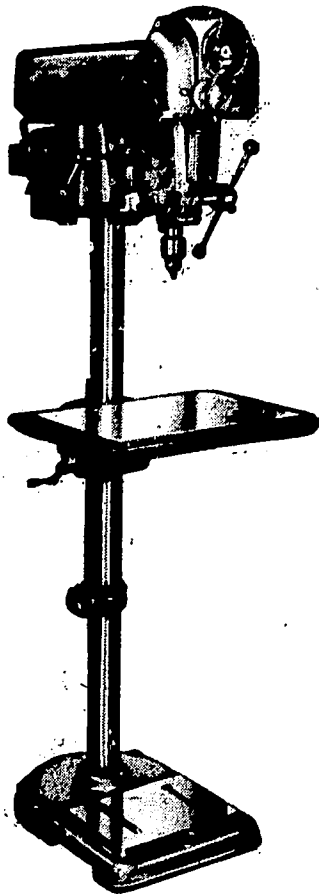
25. brace



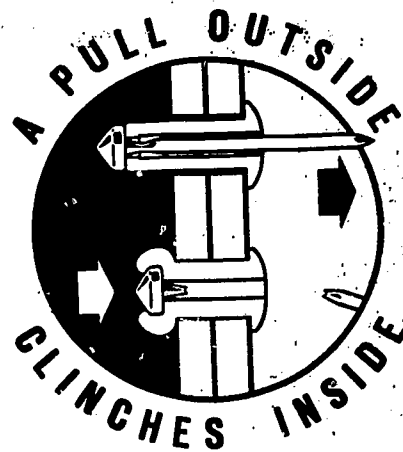
A



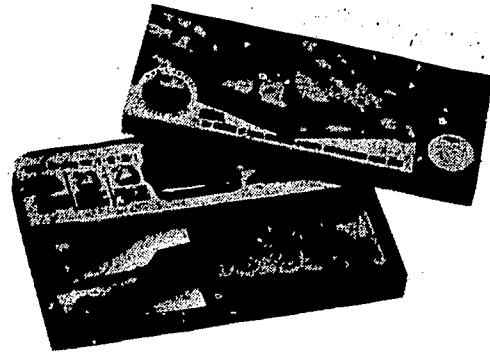
B



C



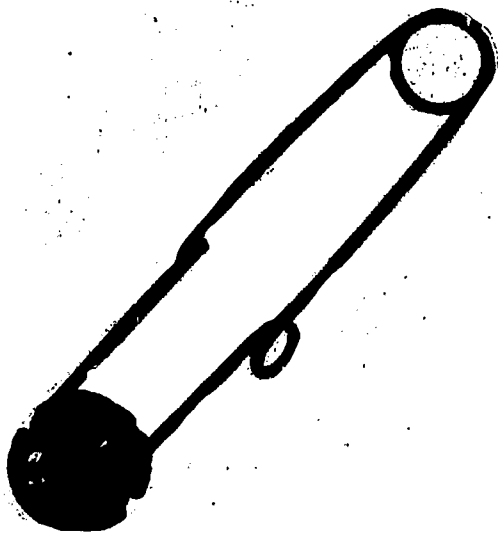
D



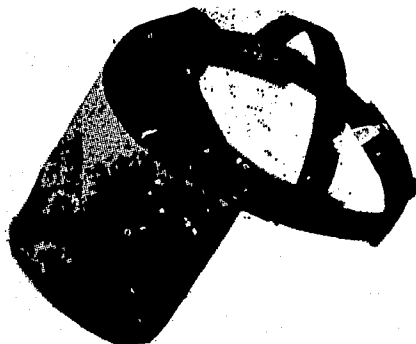
26. to protect your eyes

27. to measure the thickness of sheet metal

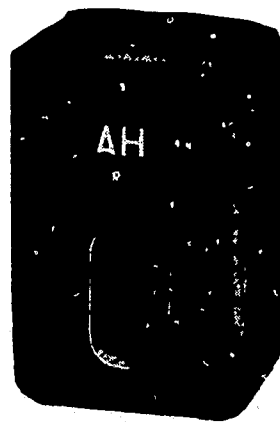
28. to start and stop power machines



A



B



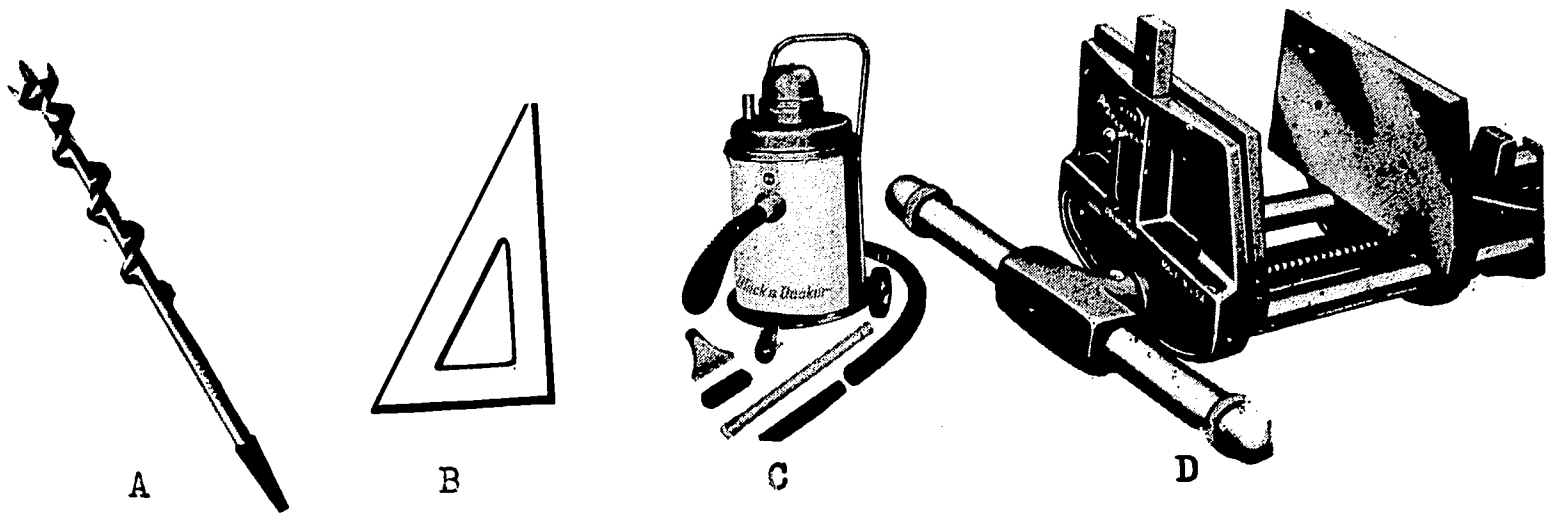
C



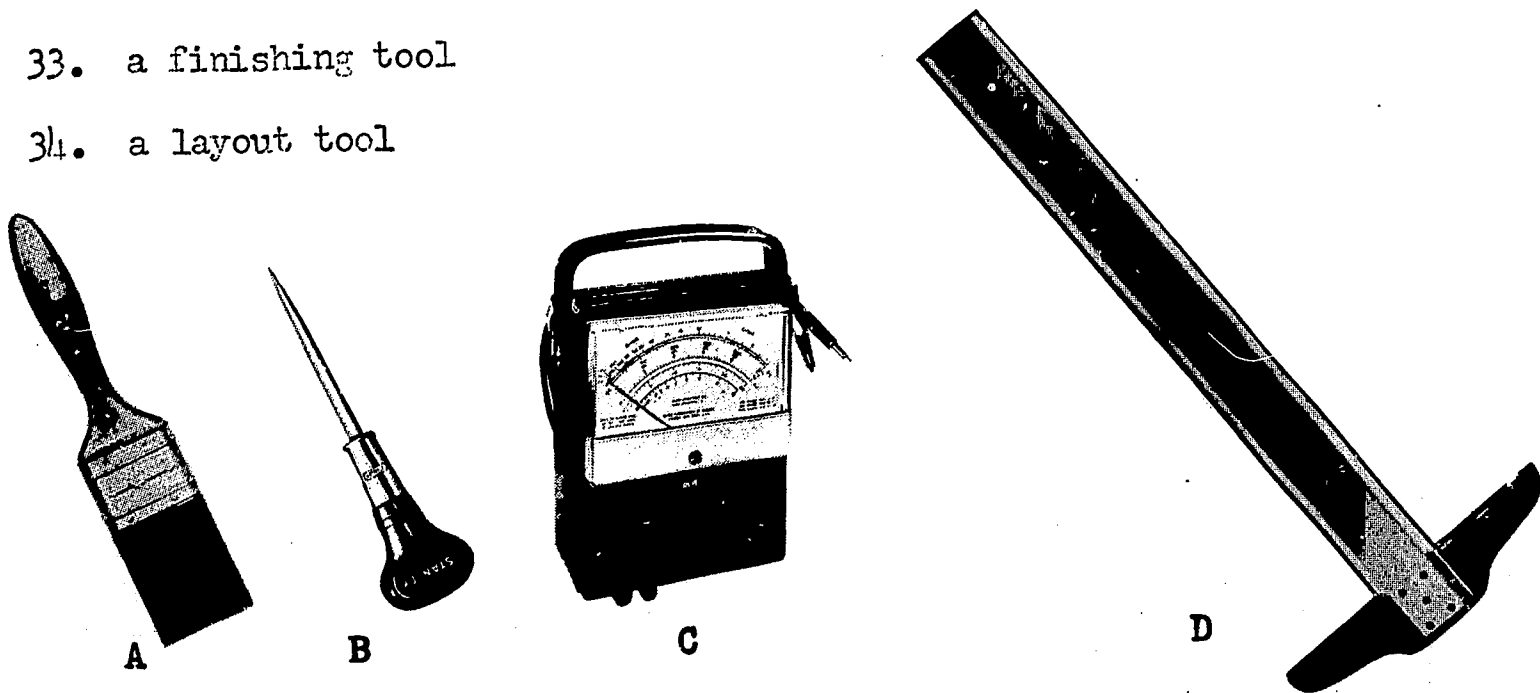
D

Final test (cont'd)  
Matching: (cont'd)

- 29. a cutting tool
- 30. used to clean
- 31. a holding tool

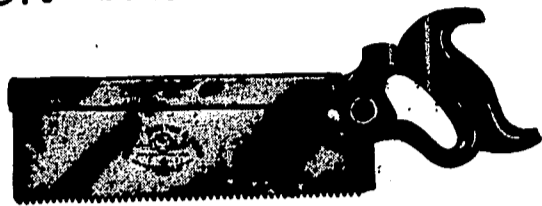


- 
- 32. to draw horizontal lines
  - 33. a finishing tool
  - 34. a layout tool

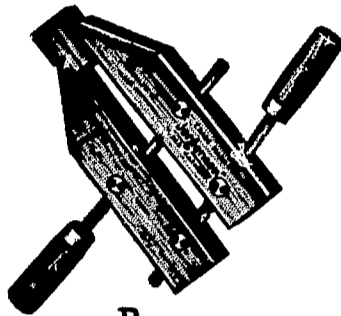


Final test: (cont'd)  
Matching: (cont'd)

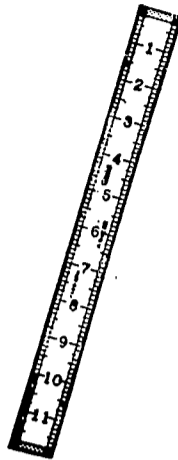
- 35. C-clamp
- 36. back saw
- 37. bench rule



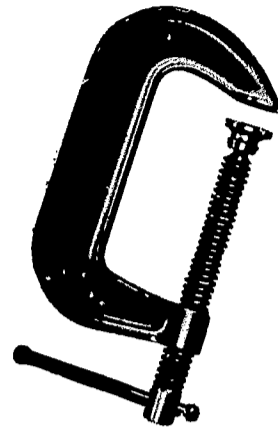
A



B



C

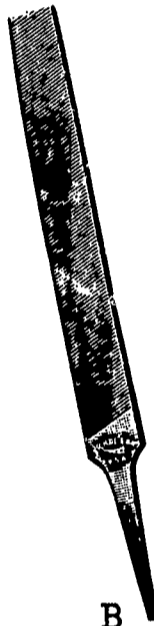


D

- 
- 38. hack saw
  - 39. ball peen hammer
  - 40. mill file



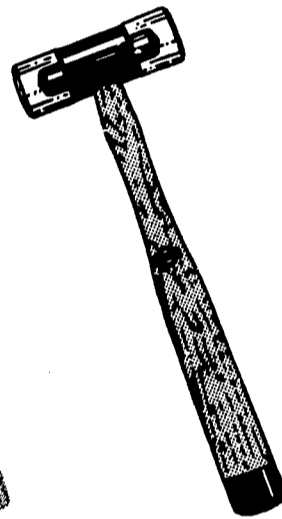
A



B

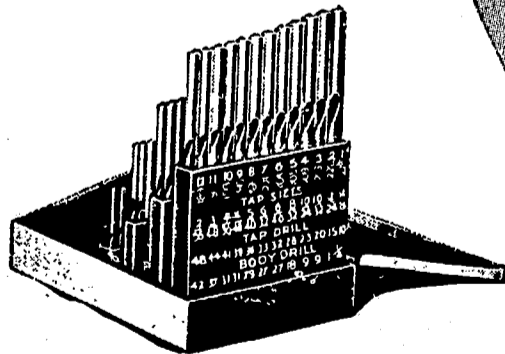


C

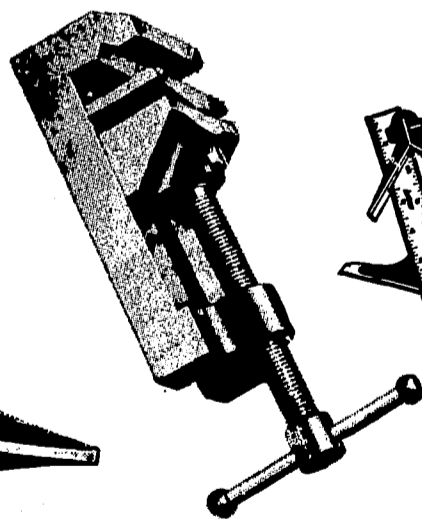


D

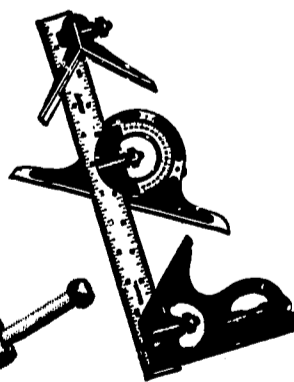
- 
- 41. drill index
  - 42. drill vise
  - 43. T-bevel



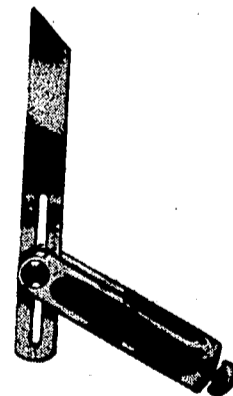
A



B



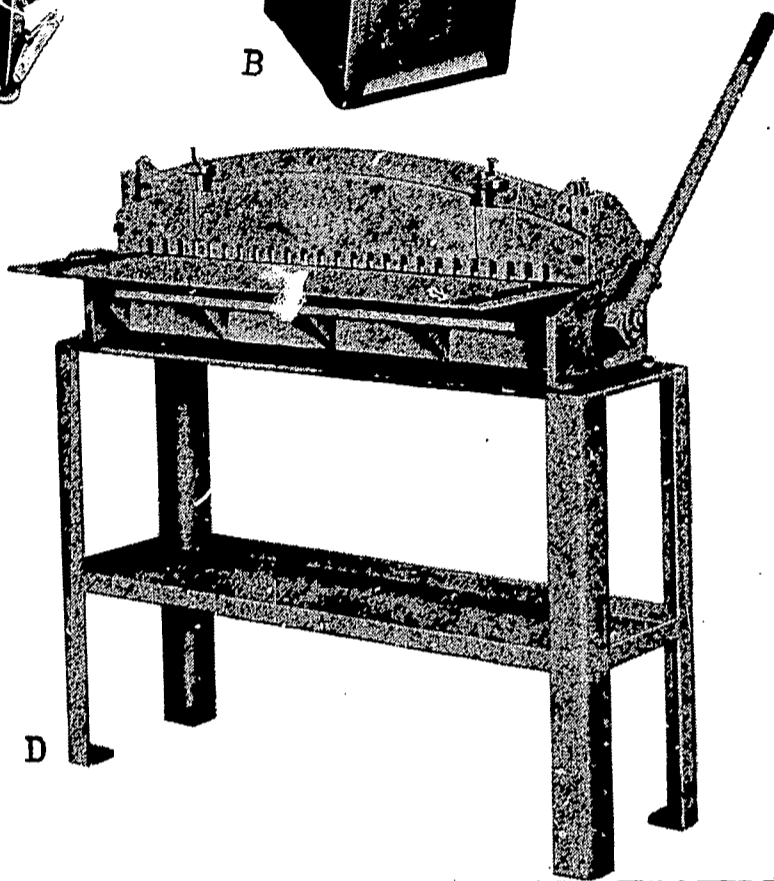
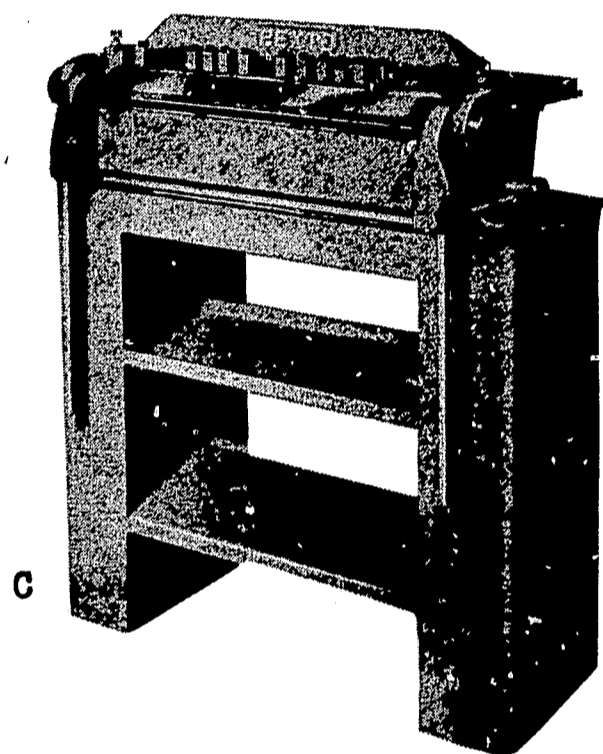
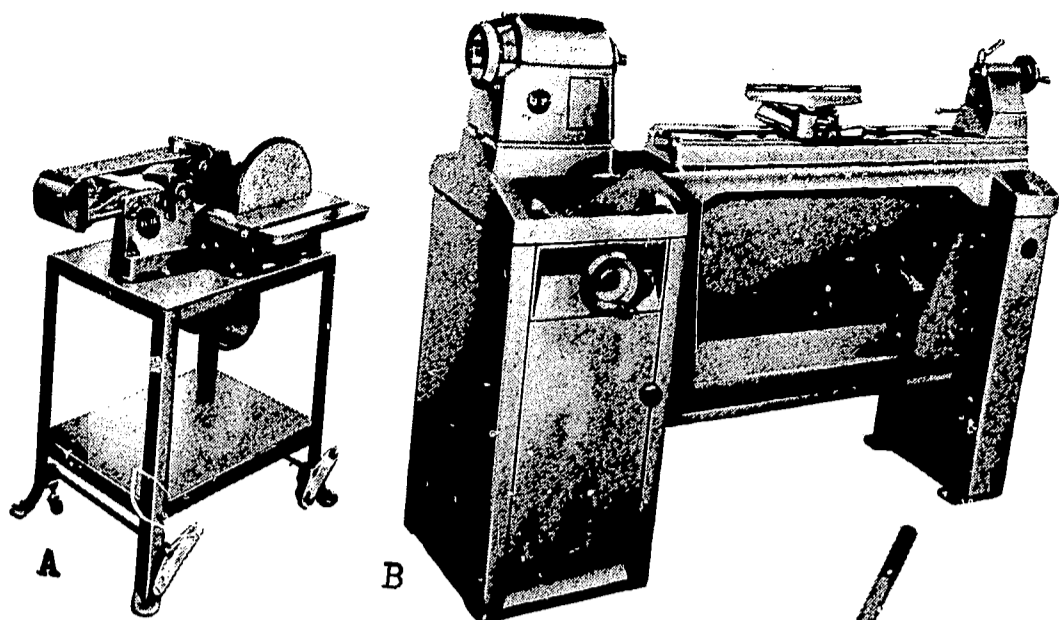
C



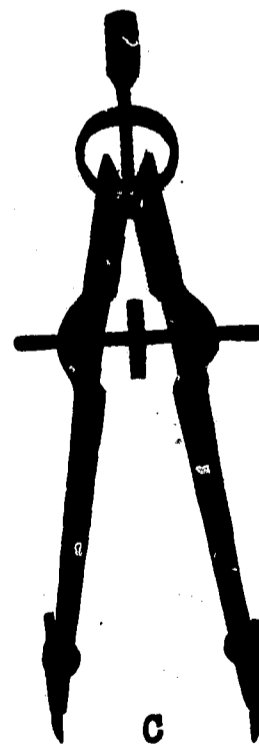
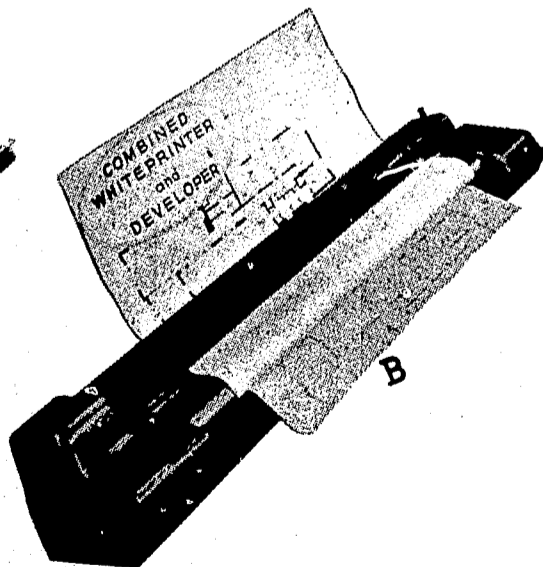
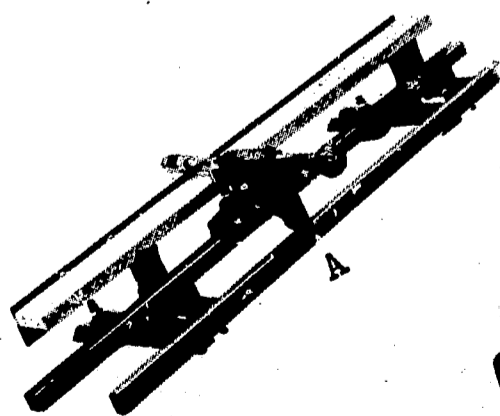
D

Final test: (cont'd)  
Matching: (cont')

- 44. wood lathe
- 45. squaring shear
- 46. belt and disc sander



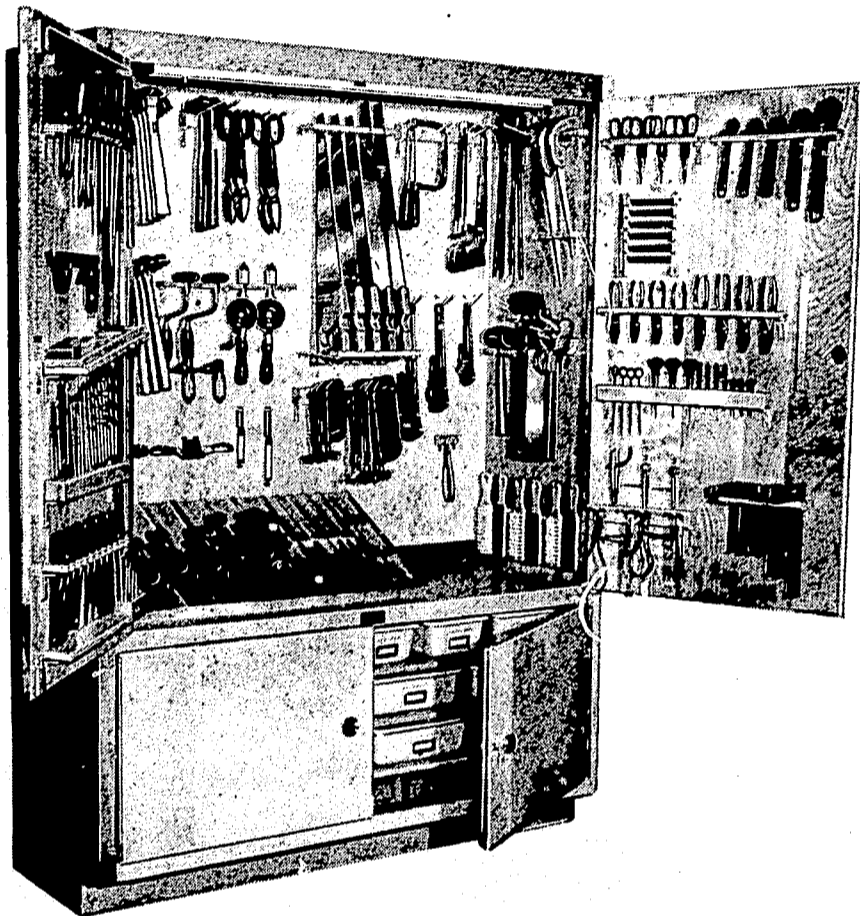
- 47. bow compass
- 48. countersink
- 49. lathe duplicator



Final test: (cont'd)  
Matching: (cont'd)

50. This picture is a:

- A. storage cabinet
- B. locker
- C. manufacturing tool panel
- D. storage shed



**True or False:** Read the following statements carefully. If the statement is true, make a heavy black dot in the "T" column on your answer sheet after the proper number. If the statement is false, make a heavy black dot in the "F" column on your answer sheet after the proper number.

1. The engineering division makes the blueprints for the production of a product.
2. The president of a corporation owns the corporation.
3. The personnel division does the interviewing and hiring of help.
4. The primary purpose of the quality control department is to prevent poor quality workmanship.
5. Most tools can be grouped under the following headings: layout, cutting, forming, holding, assembly, and finishing.
6. Tool maintenance is the job of the foreman.
7. Selling stock in a company is a method of loaning money.
8. A bond holder in a company is part owner of that company.
9. A stock holder does not have voting rights in a corporation.
10. Money paid for working by the hour is called wages.

**Completion:** In the statement below a word, or words, have been left out where the blanks are. Write the correct word, or words, in the proper blank on the answer sheet.

1. Drawing is (a)(an) \_\_\_\_\_ language.
2. The drawings used to produce a product are called \_\_\_\_\_ drawings.
3. A machine used for bending sheet metal is called (a) (an) \_\_\_\_\_.
4. Tools used to measure and layout the correct size and shape of an object are called \_\_\_\_\_ tools.

5. The devices used to guide the tools for cutting so that many pieces can be made identically are called \_\_\_\_\_.
- 6-7. Two reasons for applying finish to wood are \_\_\_\_\_ (6) \_\_\_\_\_ and \_\_\_\_\_ (7) \_\_\_\_\_.
8. A device used to hold pieces while machining a product is called (a) (an) \_\_\_\_\_.
9. A stock exchange is a place where \_\_\_\_\_ meet to buy and sell stocks and bonds.
10. Stainless steel was used on our spatula because it does not \_\_\_\_\_.

**Essay Questions:** Answer the following questions in complete sentences on the paper provided.

1. Describe the process that a product goes through from the time that it is just an idea until you buy it in the store.
2. Why is packaging of a product so important to a manufacturing industry?
3. What does the personnel division of an industry do? List at least three of its responsibilities.
4. Explain any four of the following terms:
  - a. Product design
  - b. Quality control
  - c. Tooling methods
  - d. Plant maintenance
  - e. Work schedule
  - f. Plant safety
  - g. Flow chart
  - h. Time study
5. Place the following terms in their proper spaces on the line and staff organization sheet (after the answer sheet).

President  
 Plant Superintendent  
 Employee  
 Sales and Market Manager  
 Employee  
 Blade Foreman  
 Board of Directors  
 Assembly, Finish and  
 Packaging Foreman  
 Handle Foreman

Finance Manager  
 Tang Foreman  
 Employee  
 Manufacturing Foreman  
 Quality Control Manager  
 Employee  
 Employee Relations  
 Manager  
 Engineering Research and  
 Development Manager

DATE \_\_\_\_\_

NAME \_\_\_\_\_

TEST NO. \_\_\_\_\_

AREA \_\_\_\_\_

SCORE \_\_\_\_\_

PERIOD \_\_\_\_\_

**INDUSTRIAL ARTS EXAM**

|     | A | B | C | D |
|-----|---|---|---|---|
| 1.  |   |   |   |   |
| 2.  |   |   |   |   |
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| 22. |   |   |   |   |
| 23. |   |   |   |   |
| 24. |   |   |   |   |
| 25. |   |   |   |   |

|     | A | B | C | D |
|-----|---|---|---|---|
| 26. |   |   |   |   |
| 27. |   |   |   |   |
| 28. |   |   |   |   |
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| 47. |   |   |   |   |
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| 49. |   |   |   |   |
| 50. |   |   |   |   |

|     | T | F |
|-----|---|---|
| 1.  |   |   |
| 2.  |   |   |
| 3.  |   |   |
| 4.  |   |   |
| 5.  |   |   |
| 6.  |   |   |
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| 8.  |   |   |
| 9.  |   |   |
| 10. |   |   |

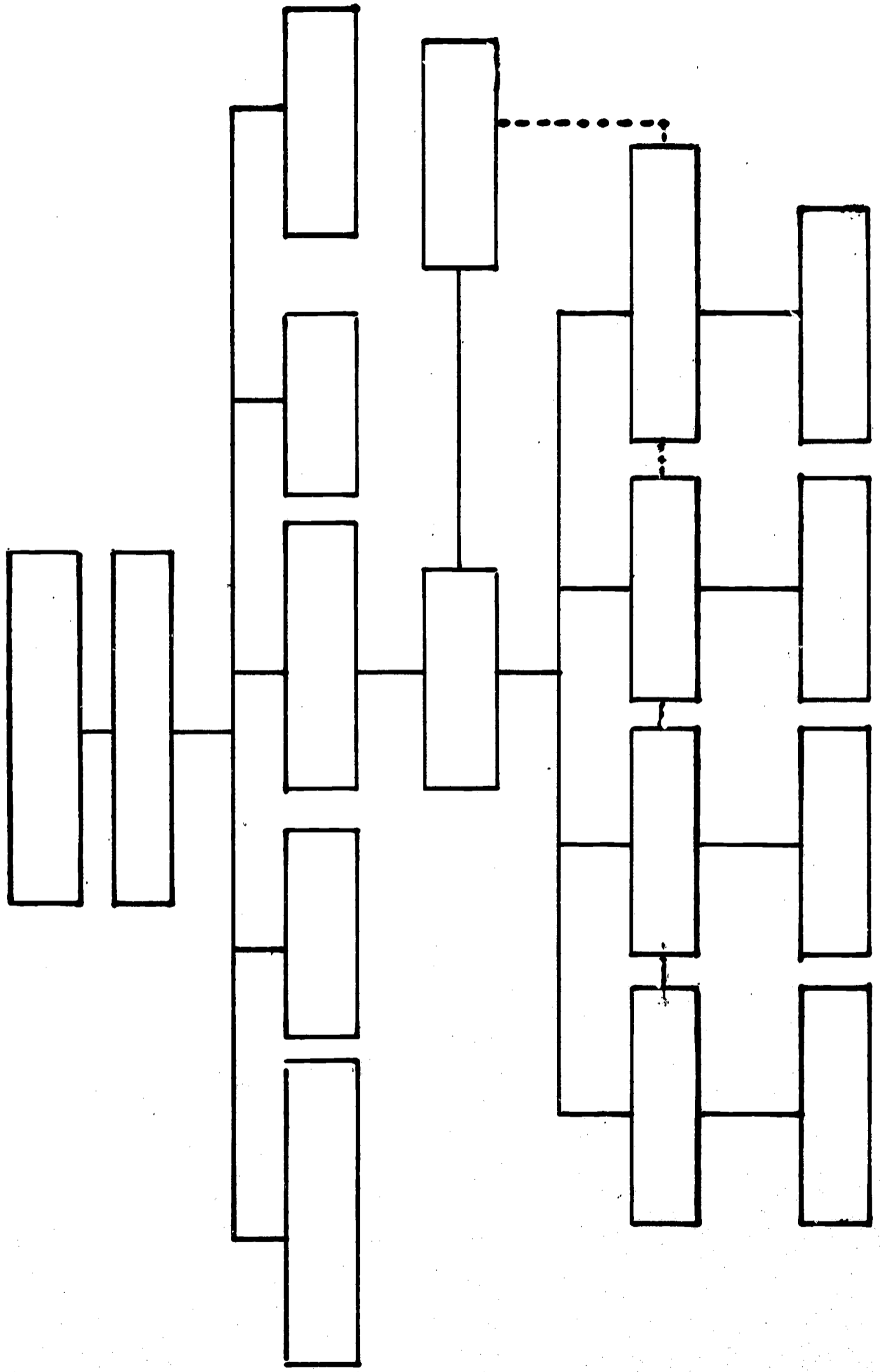
**COMPLETION**

|     |       |
|-----|-------|
| 1.  | _____ |
| 2.  | _____ |
| 3.  | _____ |
| 4.  | _____ |
| 5.  | _____ |
| 6.  | _____ |
| 7.  | _____ |
| 8.  | _____ |
| 9.  | _____ |
| 10. | _____ |



# ORGANIZATION OF CAMPCRAFTERS, INC.

## TEST ANSWER SHEET



DATE \_\_\_\_\_

NAME KEY

TEST NO. FINAL AREA \_\_\_\_\_

SCORE \_\_\_\_\_

PERIOD \_\_\_\_\_

INDUSTRIAL ARTS EXAM

|     | A | B | C | D |
|-----|---|---|---|---|
| 1.  | ● |   |   |   |
| 2.  |   |   |   | ● |
| 3.  |   |   | ● |   |
| 4.  |   | ● |   |   |
| 5.  |   |   | ● |   |
| 6.  | ● |   |   |   |
| 7.  |   |   |   | ● |
| 8.  |   |   | ● |   |
| 9.  |   | ● |   |   |
| 10. |   |   |   | ● |
| 11. | ● |   |   |   |
| 12. |   | ● |   |   |
| 13. |   |   | ● |   |
| 14. |   |   | ● |   |
| 15. | ● |   |   |   |
| 16. |   | ● |   |   |
| 17. |   |   |   | ● |
| 18. |   |   |   | ● |
| 19. | ● |   |   |   |
| 20. |   |   |   | ● |
| 21. | ● |   |   |   |
| 22. |   | ● |   |   |
| 23. |   |   |   | ● |
| 24. |   |   | ● |   |
| 25. | ● |   |   |   |

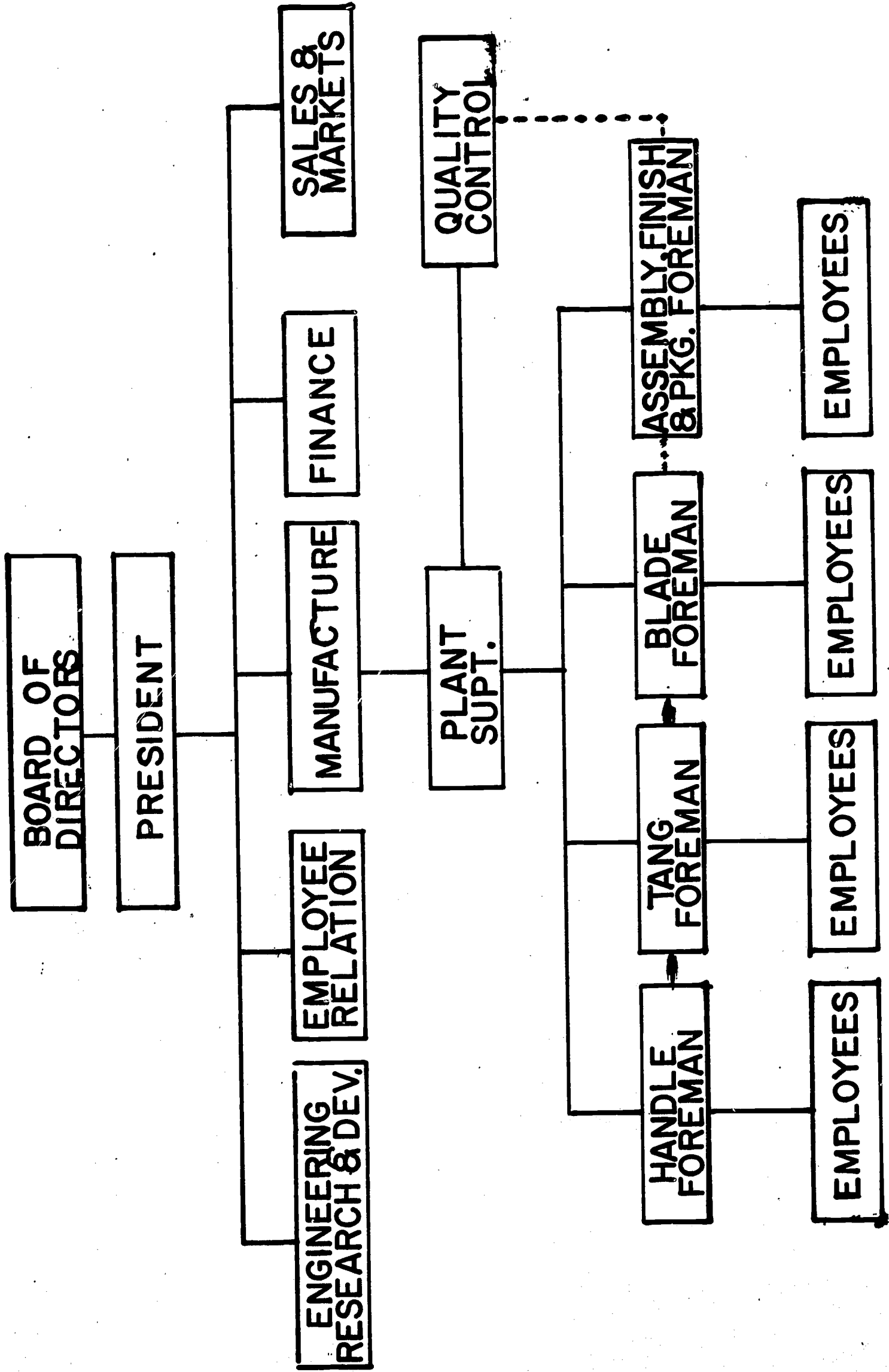
|     | A | B | C | D |
|-----|---|---|---|---|
| 26. |   | ● |   |   |
| 27. |   |   |   | ● |
| 28. |   |   | ● |   |
| 29. | ● |   |   |   |
| 30. |   |   | ● |   |
| 31. |   |   |   | ● |
| 32. |   |   |   | ● |
| 33. | ● |   |   |   |
| 34. |   | ● |   |   |
| 35. |   |   |   | ● |
| 36. | ● |   |   |   |
| 37. |   |   | ● |   |
| 38. | ● |   |   |   |
| 39. |   |   | ● |   |
| 40. |   | ● |   |   |
| 41. | ● |   |   |   |
| 42. |   | ● |   |   |
| 43. |   |   |   | ● |
| 44. |   | ● |   |   |
| 45. |   |   |   | ● |
| 46. | ● |   |   |   |
| 47. |   |   | ● |   |
| 48. |   |   |   | ● |
| 49. | ● |   |   |   |
| 50. |   |   | ● |   |

|     | T | F |
|-----|---|---|
| 1.  | ● |   |
| 2.  |   | ● |
| 3.  | ● |   |
| 4.  | ● |   |
| 5.  | ● |   |
| 6.  |   | ● |
| 7.  |   | ● |
| 8.  | ● |   |
| 9.  |   | ● |
| 10. | ● |   |

COMPLETION

1. international - or universal
2. working
3. box & pan brake - or bar folder
4. layout
5. jigs
6. protection or appearance
7. appearance or protection
8. fixtures
9. brokers
10. rust

# ORGANIZATION OF CAMPCRAFTERS, INC.

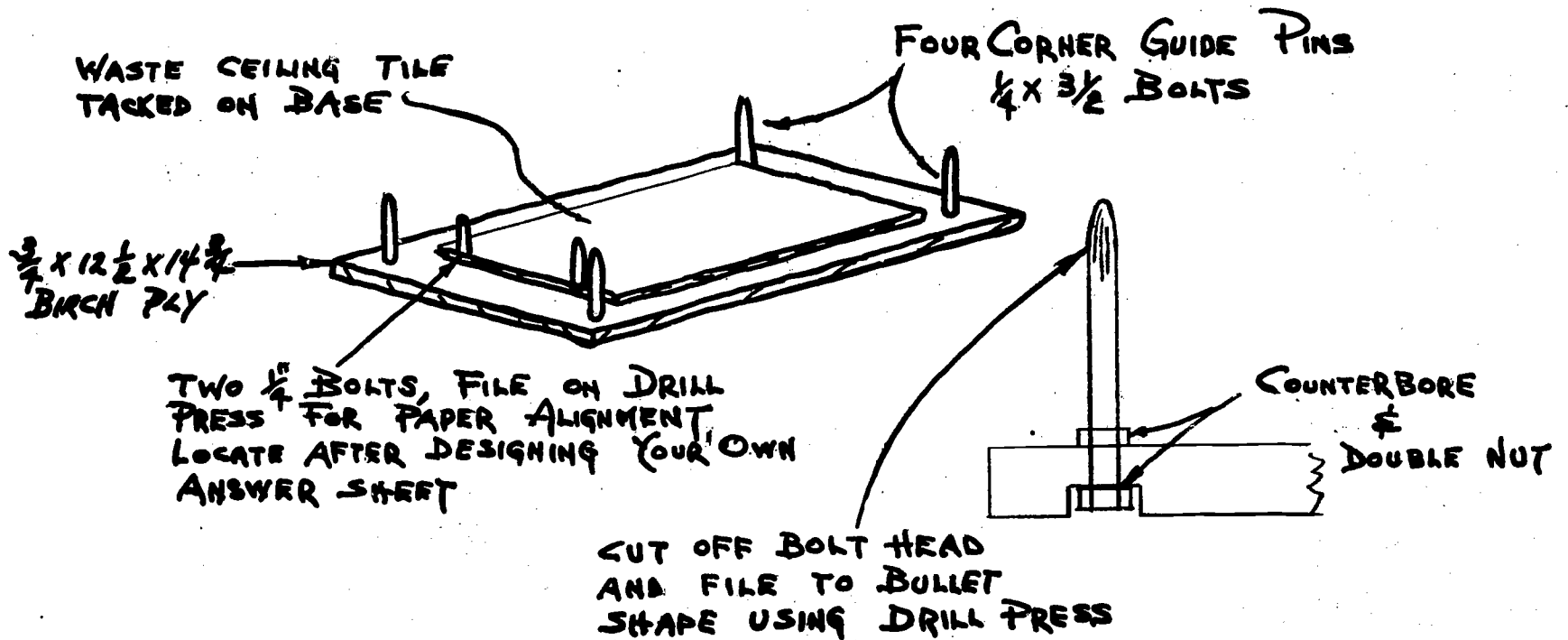
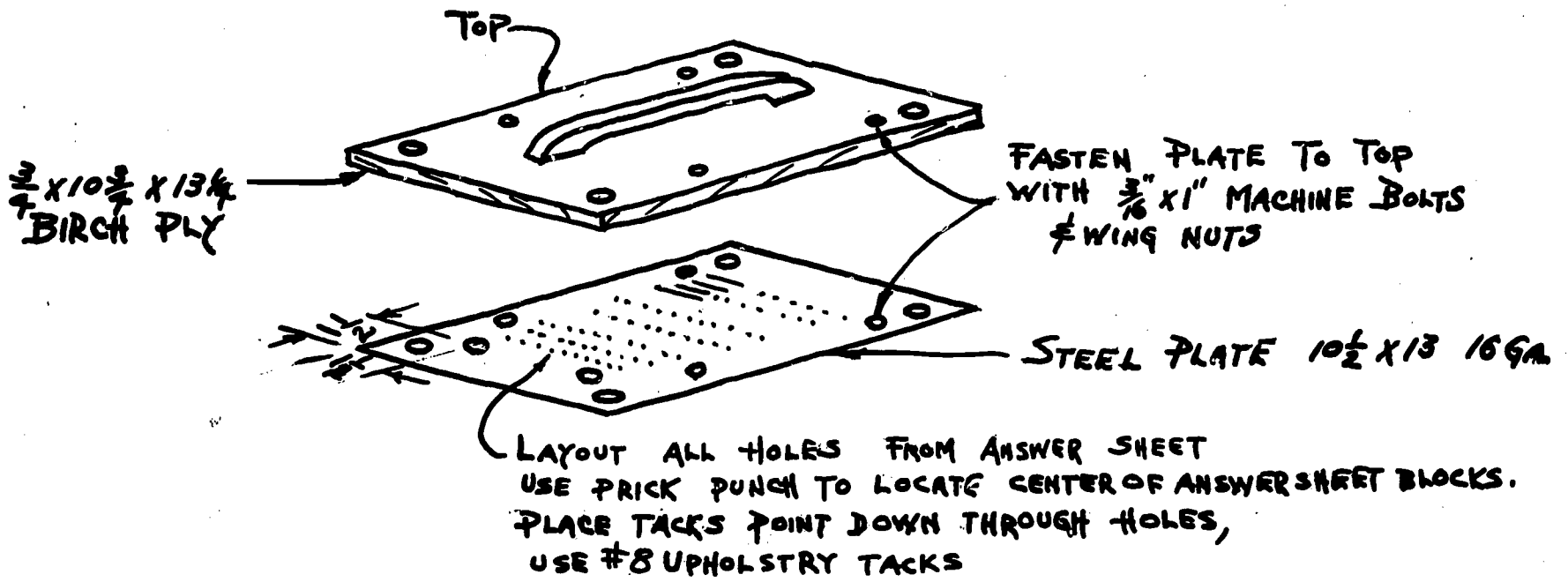


ANSWER SHEET: Essay questions

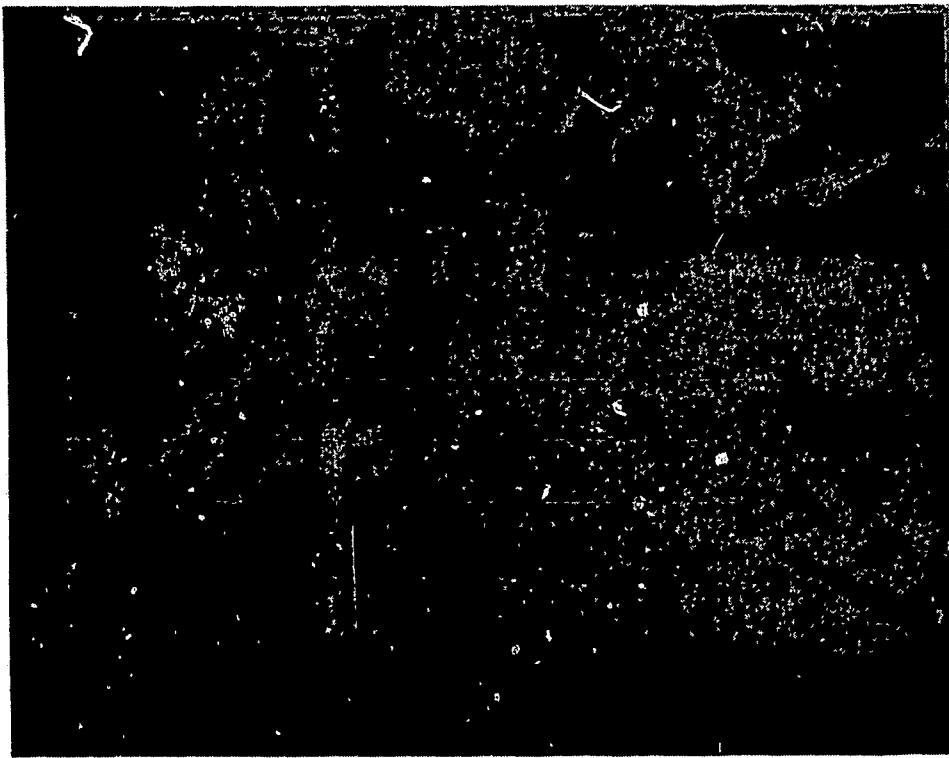
1.
  - a. idea
  - b. sketch
  - c. models
  - d. select final idea
  - e. engineering drawings
  - f. make tools
  - g. buy material
  - h. make product
  - i. package product
  - j. ship product to retail outlet
  - k. sell product in store
  
2.
  - a. protect item
  - b. eye appeal
  - c. advertising
  - d. directions for use
  - e. guarantees printed on package
  - f. safety
  - g. identifies trade marks
  
3.
  - a. hires and fires employees
  - b. keeps employee records
  - c. training of employees
  - d. union negotiations
  - e. employee relations (social, counseling, safety)
  
4.
  - a. Product design - planning a new product
  - b. Quality control - see that the customer gets a product that is of a quality he is willing to pay for
  - c. Tooling methods - making of special tools, jigs and fixtures
  - d. Plant maintenance - keeping tool, machines, equipment and plant clean and in good working order
  - e. Work schedule - list of operations to be performed and the time that they are to be done
  - f. Plant safety - program to be followed to keep all personnel safe from physical harm while working on the job
  - g. Flow chart - the chart of motion of the parts as they pass through a mass production industry
  - h. Time study - an accurate timing of each operation necessary to produce a product

# EASY SCORE- ANSWER SHEET DEVICE

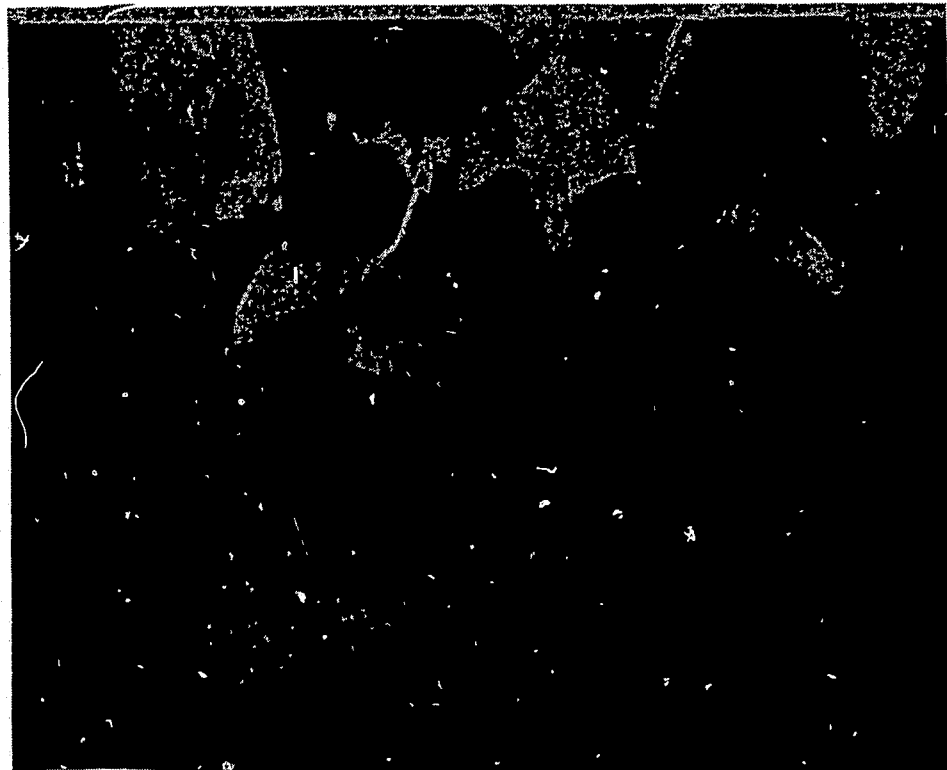
PUNCHES HOLES IN ANSWER SHEETS



EXAMPLES OF PUPIL WORK DEVELOPED DURING THE COURSE OF THIS UNIT



*COUNTERSINKING*

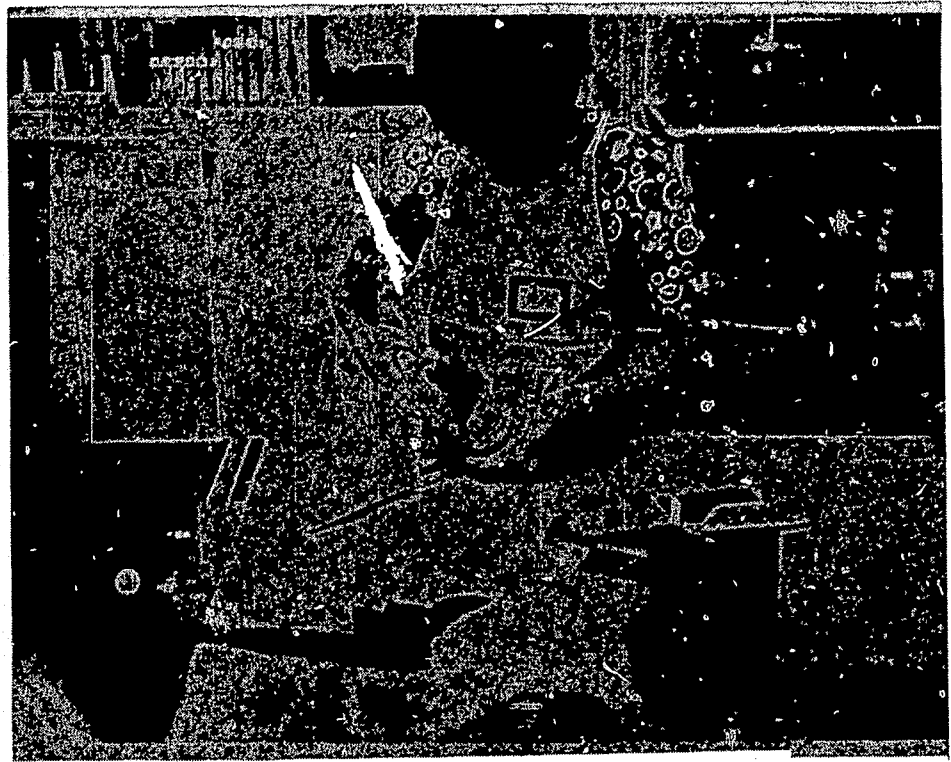


*ASSEMBLY*

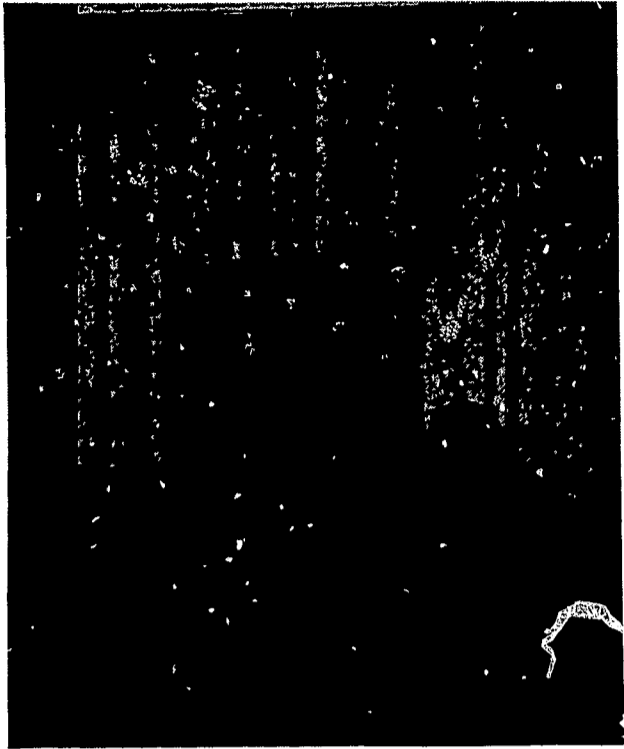


*SHAPING*

*ABOUT READY FOR  
"QUALITY CONTROL"*



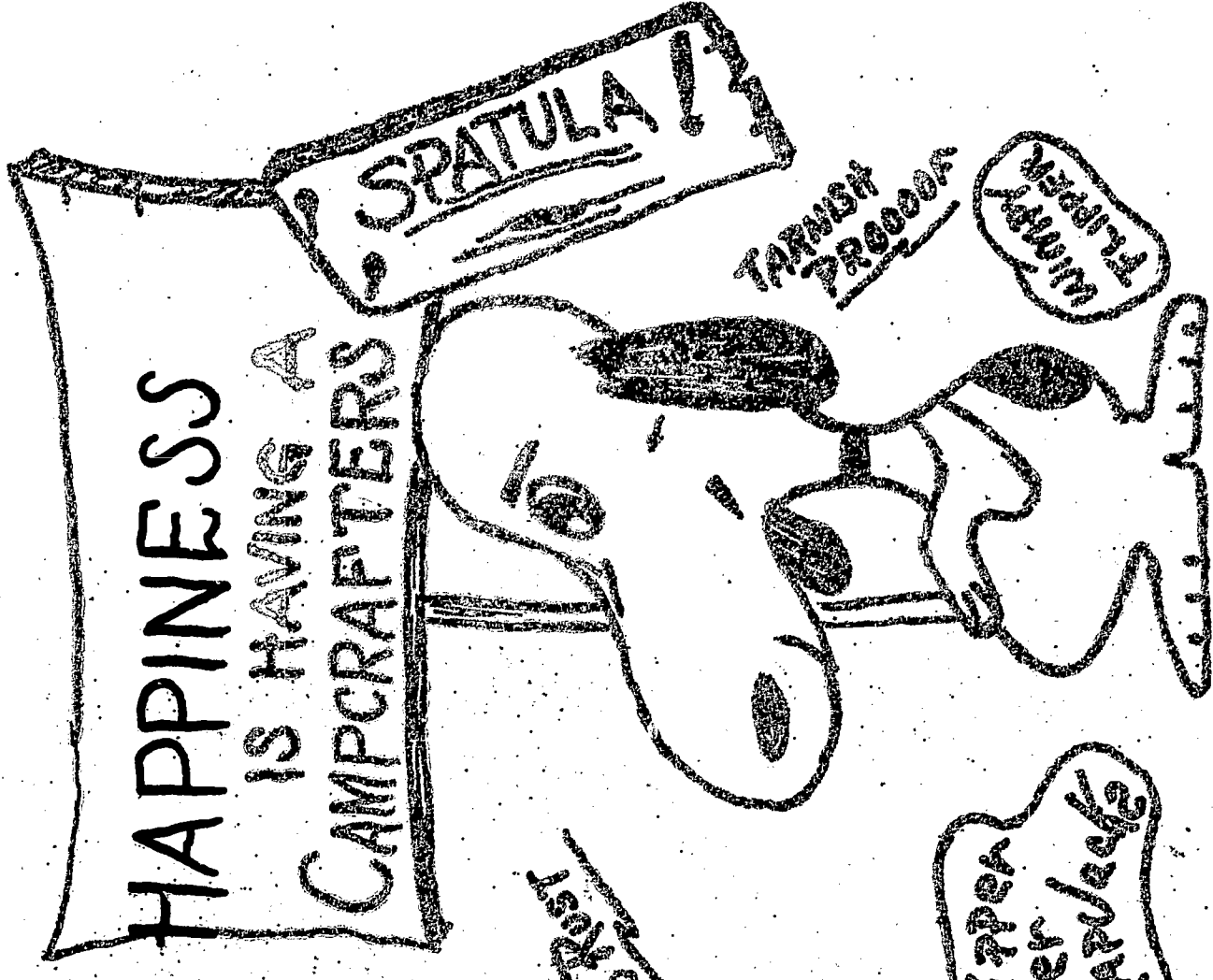
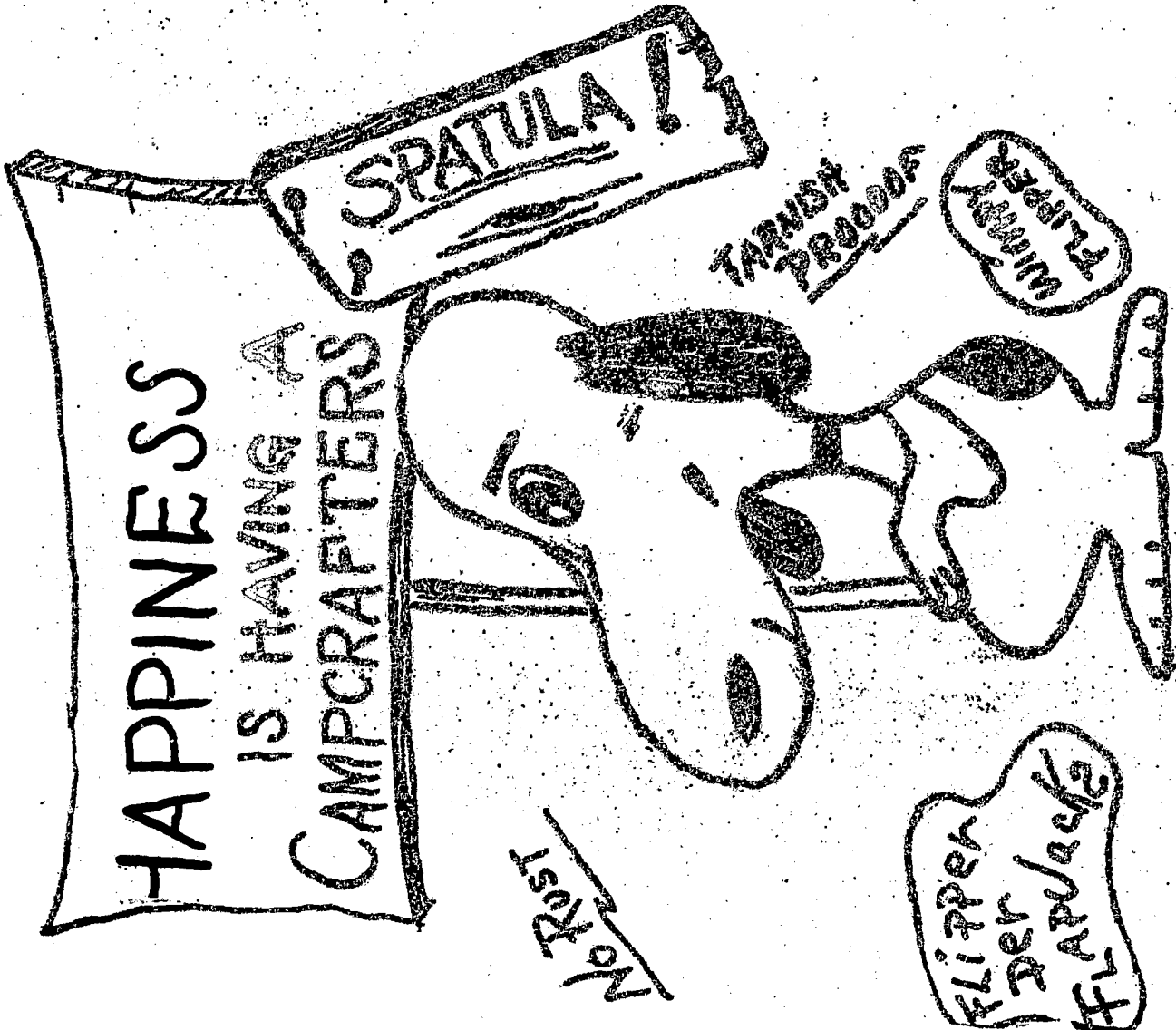




*ADVERTISING  
POSTER*



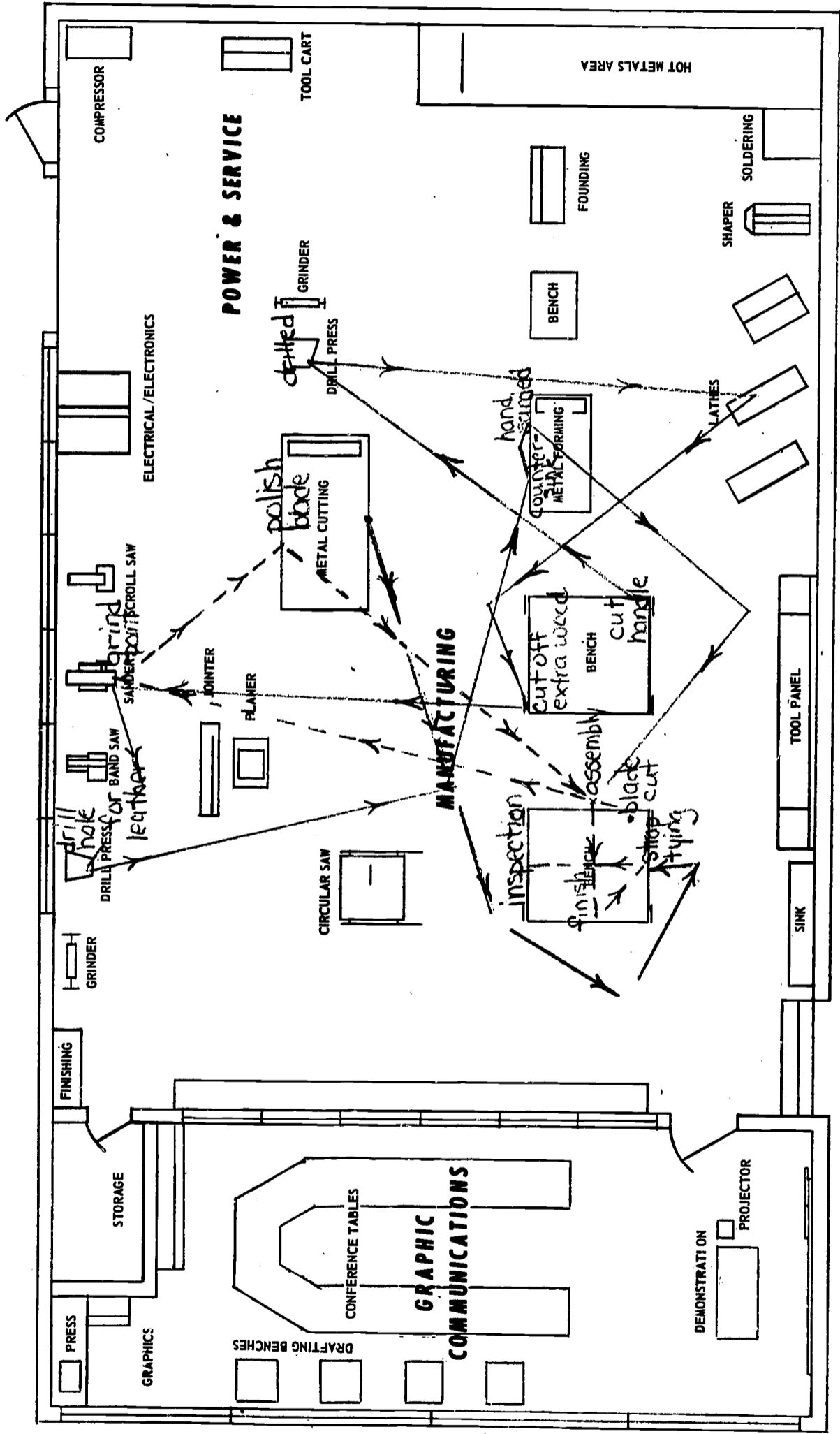
*FINISHING  
HANDLE*



CAMPCRAFTERS INC. GORHAM-MAINE

CAMPCRAFTERS INC. GORHAM-MAINE

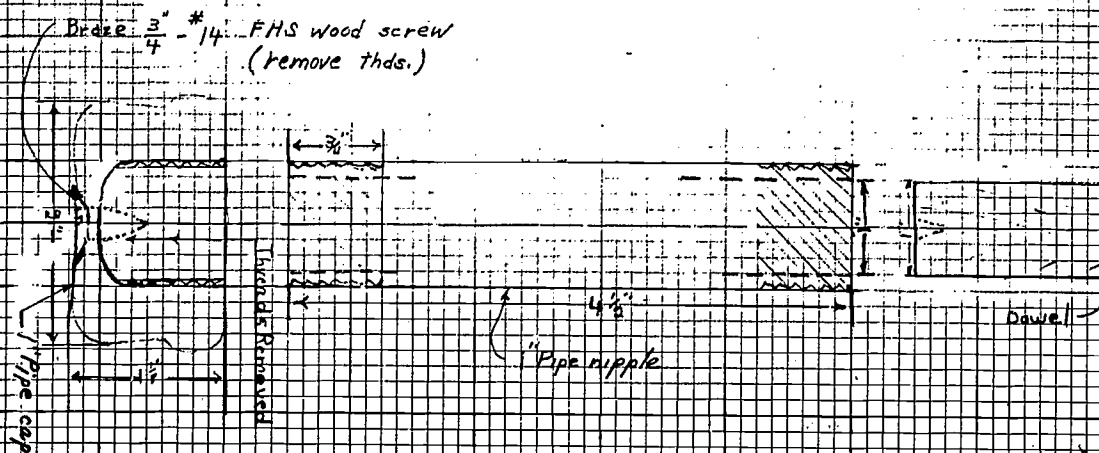
# Flow Chart for Skewers CAMCRAFTERS INC.



————— = handle  
 - - - - - = blade  
 - - - - - = strap  
 - - - - - = assembly, finish, strap tying, inspection  
*by Nancy Steil*

**LABORATORY OF INDUSTRIES**  
 GORHAM STATE COLLEGE

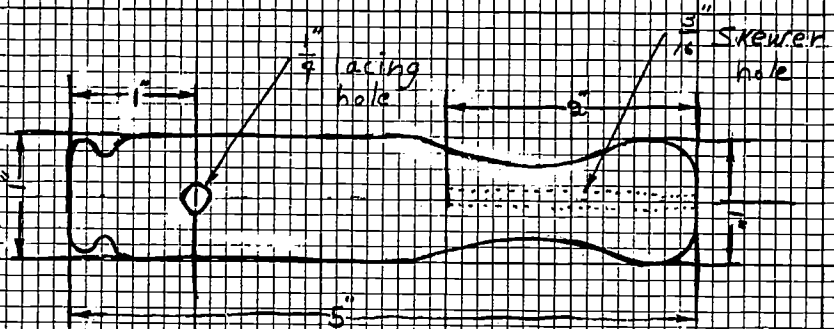
For Correct Use Insert  
Bowl-Turn Twice



Campcrafters Inc  
Gorham, Maine

Center Jig  
Scale: Full

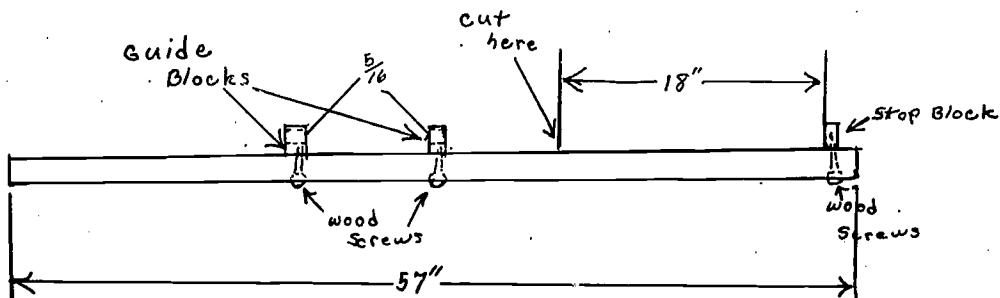
Drawn By: Andrew Bent  
Checked By: J. J.



Campcrafters  
Gorham, Maine

Handle Detail

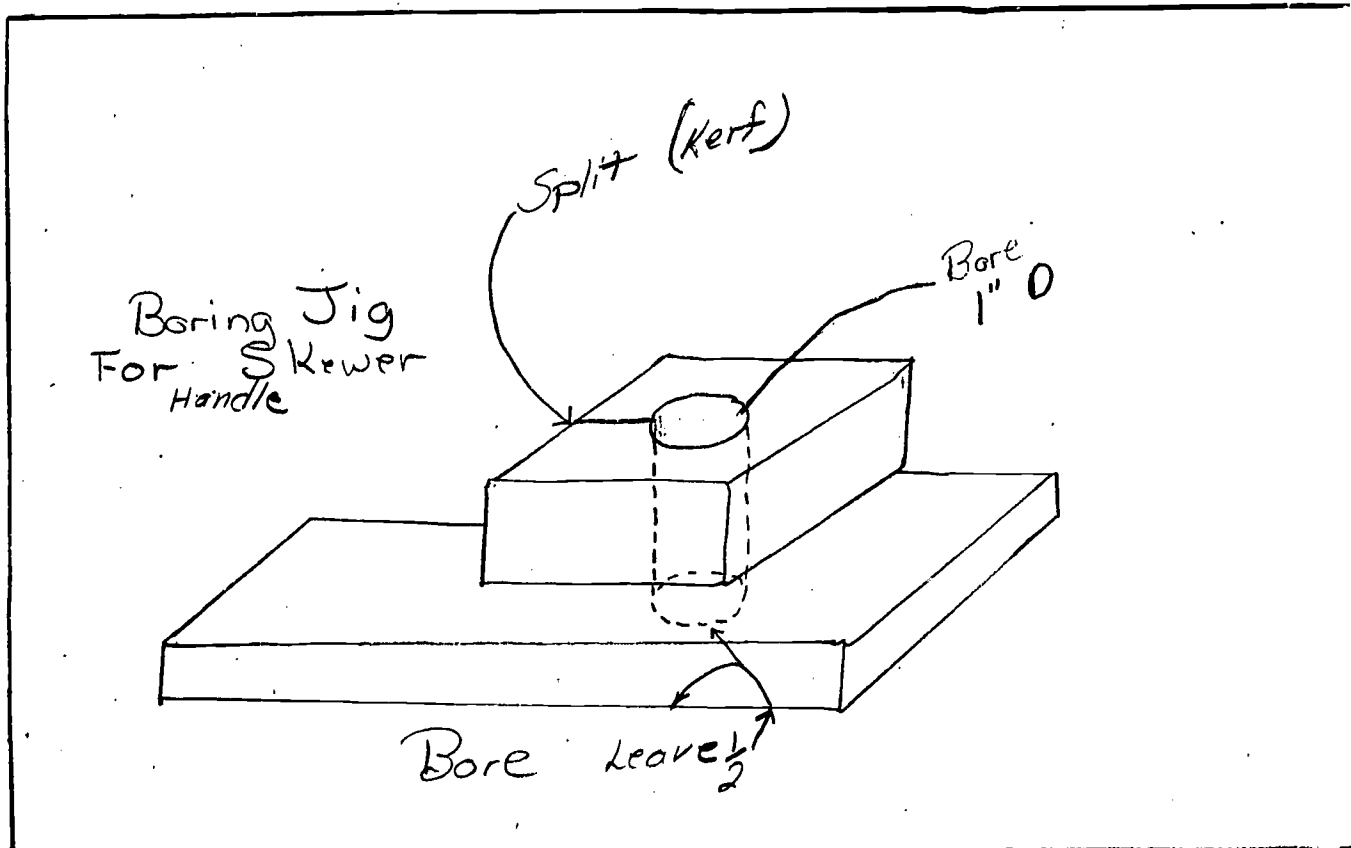
Drawn By Andrew Bent  
Checked By J. J.



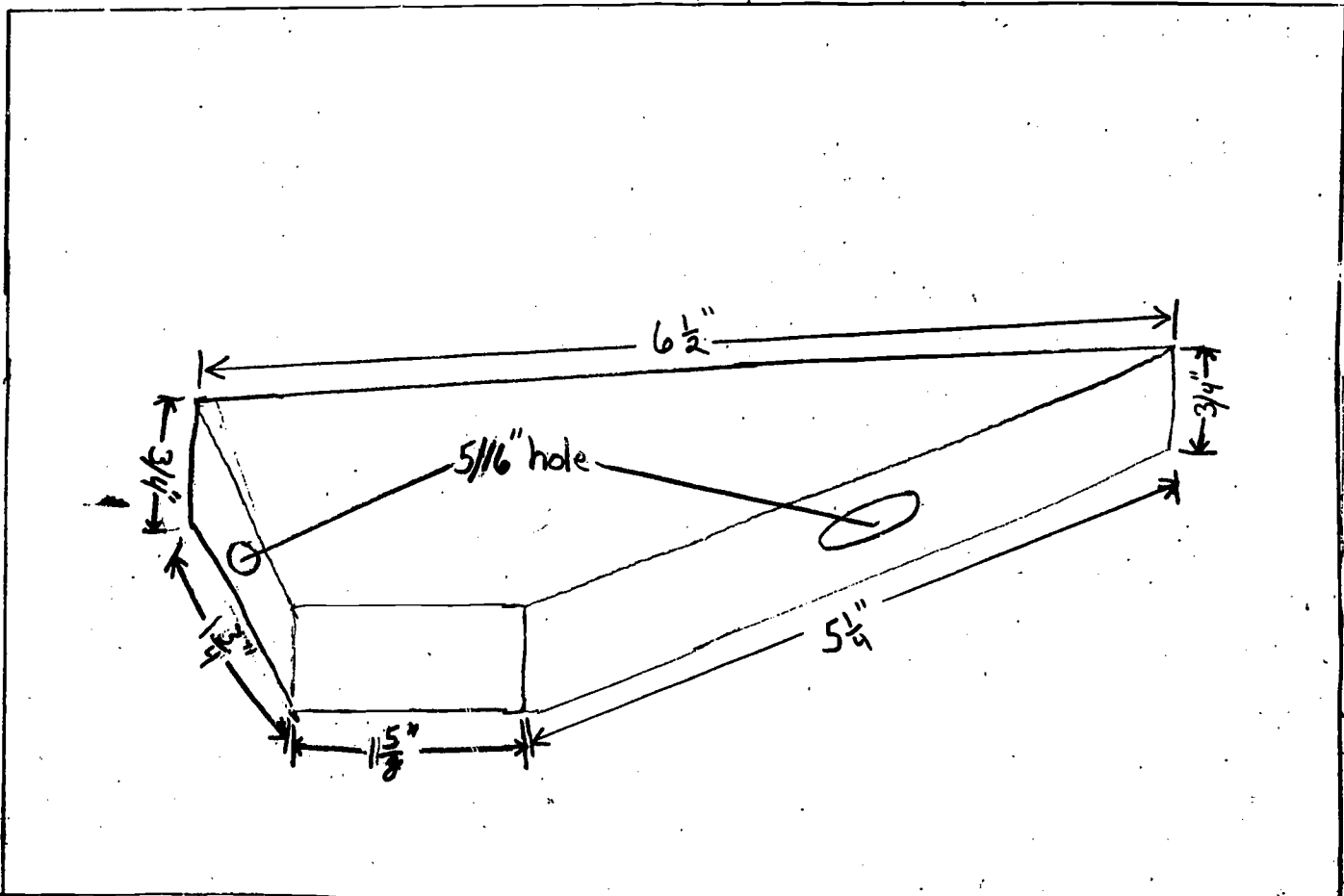
CAMP CRAFTERS  
GORHAM, MAINE

BLADE  
JIG

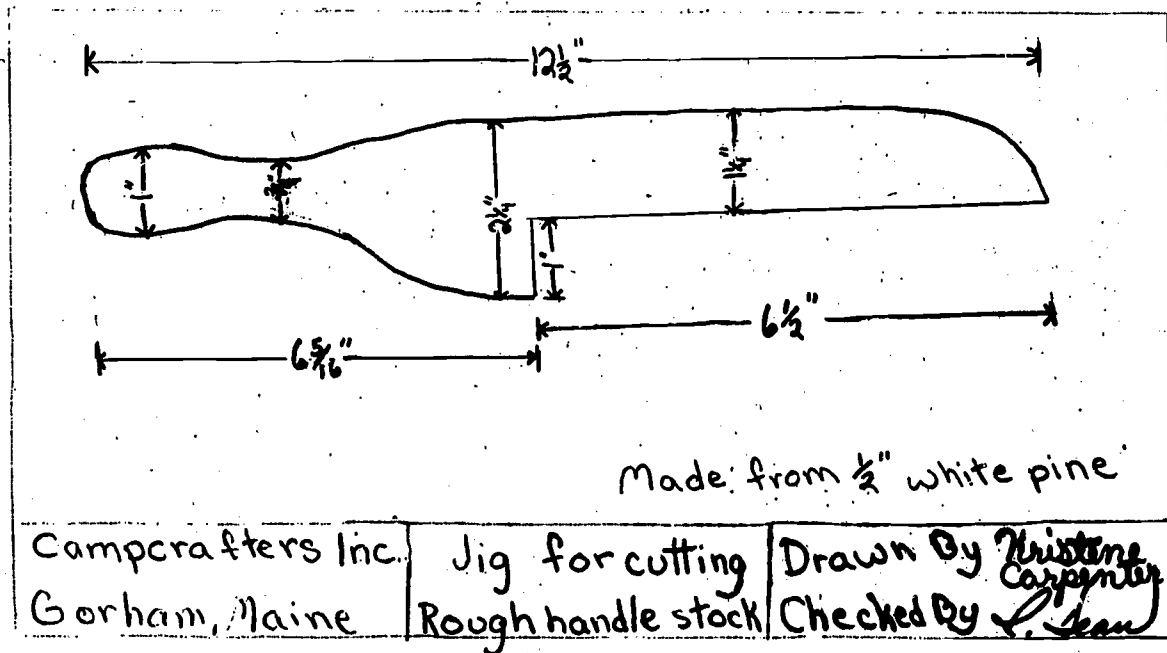
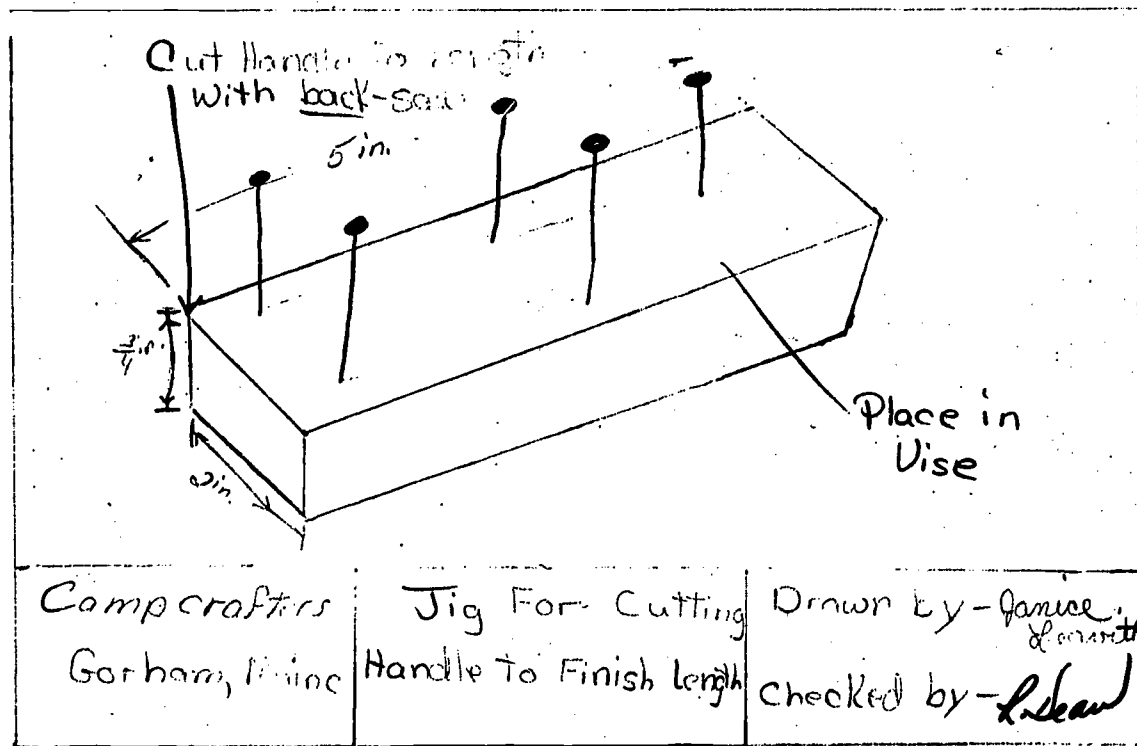
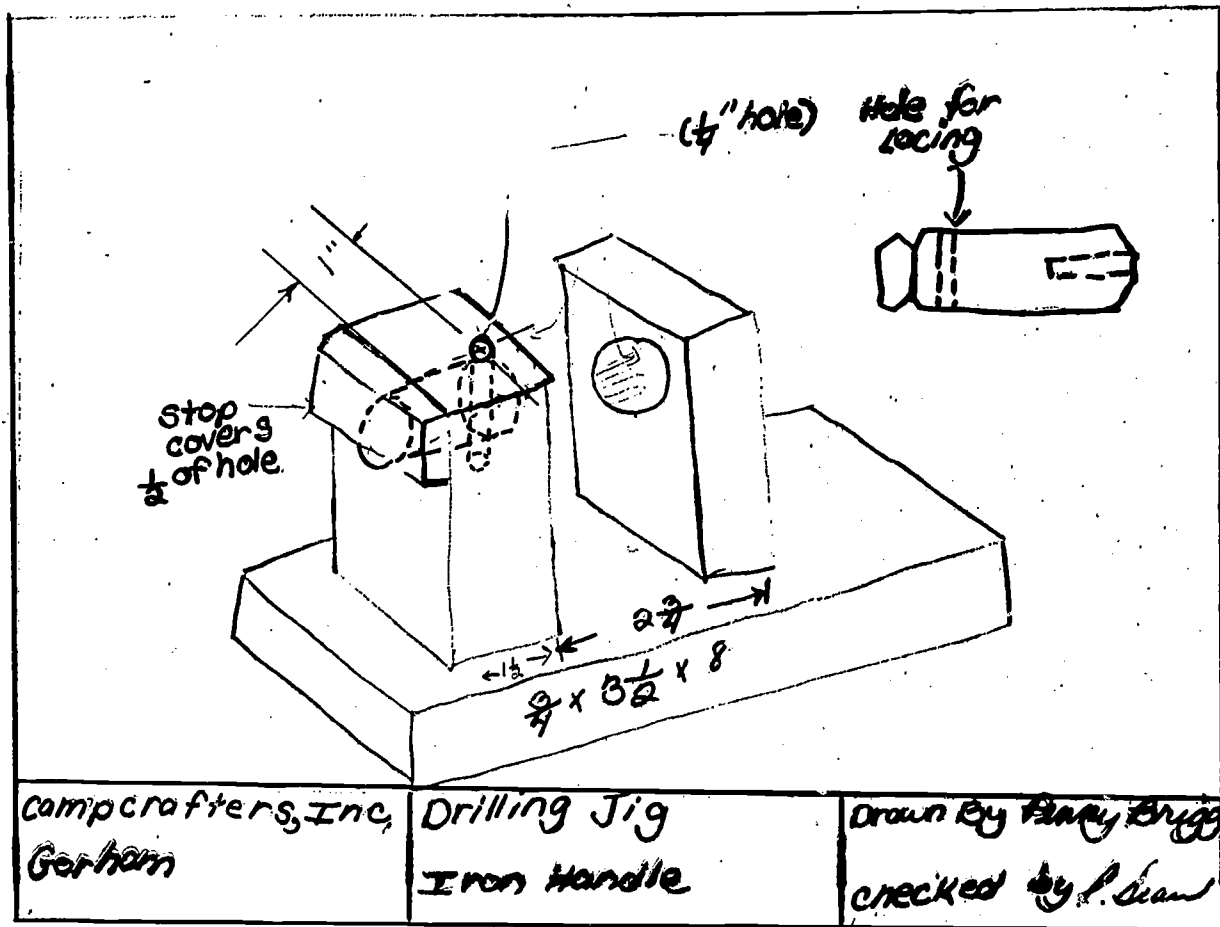
DRAWN BY Joseph K. Ramsdell  
CHECKED BY J. J.



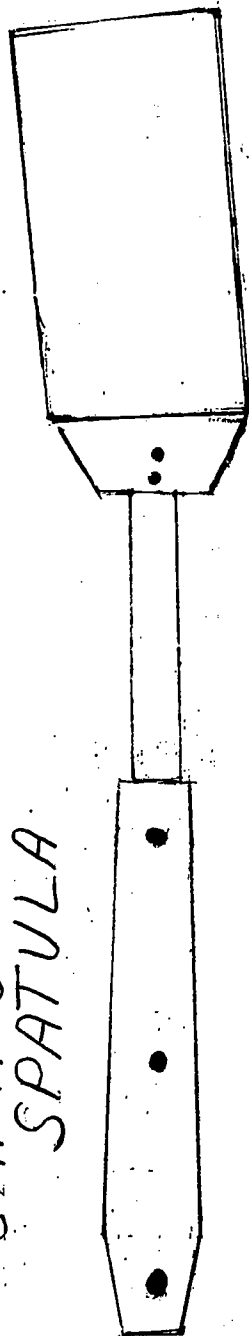
|                              |                                              |                                                                |
|------------------------------|----------------------------------------------|----------------------------------------------------------------|
| Camcrafters<br>Gorham, Maine | Jig<br>For drilling Skewer<br>Hole in Handle | Drawn By - <i>George Wright</i><br>Checked By - <i>R. Swan</i> |
|------------------------------|----------------------------------------------|----------------------------------------------------------------|



|                              |                         |                                                    |
|------------------------------|-------------------------|----------------------------------------------------|
| Camcrafters<br>Gorham, Maine | Blade<br>Sharpening Jig | Drawn By<br><i>Kristene<br/>         Carpenter</i> |
|------------------------------|-------------------------|----------------------------------------------------|

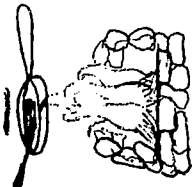


CAMPCRAFTER'S  
SPATULA



*The spatula for camp and home*

Linda  
Arthur



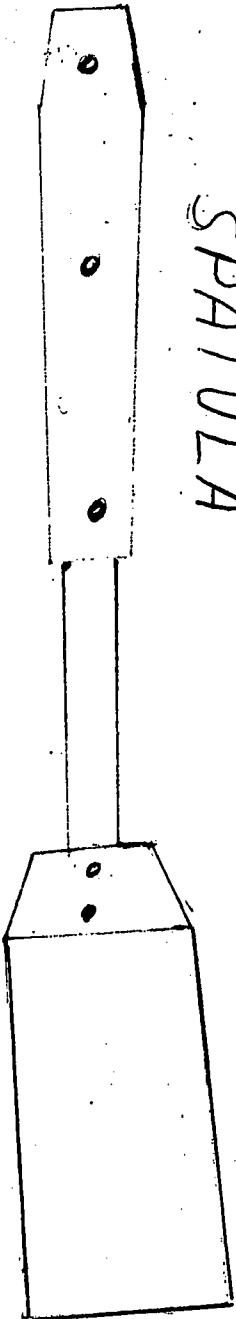
At camp  
or



At home

*All this spatula needs for  
proper care is to be cleaned  
after every use*

CAMPCRAFTER'S  
SPATULA



*The spatula for camp and home*

CAMPCRAFTER'S  
SPATULA

*This spatula is made of stainless steel  
with a wooden handle*

*This spatula will give  
a long service is properly  
cared for*

STUDENT DESIGNED BOX

# CAMPERS AFTER

HAVE YOU HAD SHISH KEBAB LATELY ?

WELL, BUY THESE SKEWERS

AND SEE WHAT YOU'VE BEEN

MISSING !



TITLE OF UNIT

INTRODUCTION TO TECHNOLOGY AND INDUSTRIAL ARTS

TEACHING TEAM

DANIEL L. BREY  
GLEN O. HAYES  
RODNEY H. HOFFMAN  
RAY O. JONES  
WILLIAM E. SMITH

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College  
Gorham, Maine

July 1 - August 9, 1968

## INTRODUCTION:

Industrial arts has a responsibility to help meet the needs of youth to discover their interests, abilities, limitations, and opportunities in a world challenged by industry and technology, invention and progress.

Technology affects everyone. It is a part of our culture, cannot be separated from everyday life, and an understanding and knowledge of it is essential for all.

SCOPE:

This unit is intended to be used with 8<sup>th</sup> grade boys and girls that have not had any previous industrial arts experience.

To accomplish the objectives of this unit, it is recommended that no more than two 40 minute class periods be used.

**OBJECTIVE 1:** To develop an understanding of the meaning and purpose of industrial arts and its relationship to industry

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                           | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                              | TEACHER LESSONS                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>1. Recognize the role of industrial arts in education.</li> <li>2. Relate the industrial arts program to industry and technology</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. Discuss the role of industrial arts in education.</li> <li>2.               <ol style="list-style-type: none"> <li>a. Discuss the relation of the industrial arts program to industry and technology.</li> <li>b. Observe closed circuit TV as an example of technology.</li> </ol> </li> </ol> | <p>Industrial Arts and its Relationship to Technology</p> |

**OBJECTIVE 2: To develop desirable attitudes toward the organization and operation of the industrial arts program**

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                                                                                                              | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                       | TEACHER LESSONS                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>1. Recognize the course requirements and what is expected of him.</li> <li>2. Recognize what constitutes safe laboratory procedures.</li> <li>3. Recall the location and proper care of the common tools, materials and supplies of the laboratory.</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. Discuss course requirements and what is expected of him.</li> <li>    b. Fabricate name tags.</li> <li>2. Discuss safety procedures.</li> <li>3. a. Tour the laboratory.</li> <li>    b. Fill in equipment names on laboratory floor plan.</li> </ol> | <p>Overview of the Industrial Arts Program</p> <p>Organization and Management of the Industrial Arts Laboratory</p> |

**APPROACH:**

1. Introduction of teachers and pupils.
2. Laboratory tour to relate industrial arts tools and equipment to the tools of industry and technology.
3. Pupils will fabricate name tags to create interest.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

American Council on Industrial Arts Teacher Education, A Historical Perspective of Industry, American Council on Industrial arts Teacher Education, Bloomington, Illinois: McKnight and McKnight, 1968.

American Vocational Association, A Guide to Improving Instruction in Industrial Arts, Washington, D. C.: American Vocational Association, 1953.

Amrine, Harold T.; Ritchey, John A.; Hulley, Oliver S., Manufacturing Organization and Management, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966.

Department of Education, Industrial Arts Technology, A Study of American Industry, Augusta, Maine: State of Maine Department of Education, Bureau of Vocational Education, 1965.

Groneman, Chris H. and Feirer, John L., General Shop, New York: McGraw-Hill Book Company, Inc., 1963.

Olson, Delmar W., Industrial Arts and Technology, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963.

State University of New York, Oswego, Field Study in Industry for the Preparation of Industrial Arts Teachers, Washington, D. C.: U. S. Department of Health, Education and Welfare, 1967.

**RESOURCE MATERIALS:**

**B. TEACHING AIDS OR DEVICES**

1. Pupil information forms
2. Duplicated laboratory layout
3. Film: Technology and You; Audio-Visual Center, Bloomington, Indiana, \$1.75 rental
4. Transparencies:

Common Elements of Industry



PUPIL INFORMATION CARD

NAME \_\_\_\_\_ TELEPHONE NO. \_\_\_\_\_

ADDRESS \_\_\_\_\_ AGE \_\_\_\_\_

FATHER'S NAME \_\_\_\_\_ OCCUPATION \_\_\_\_\_

MOTHER'S NAME \_\_\_\_\_ OCCUPATION \_\_\_\_\_

NUMBER OF BROTHERS AND SISTERS \_\_\_\_\_

DO YOU PLAN TO GO TO COLLEGE? \_\_\_\_\_

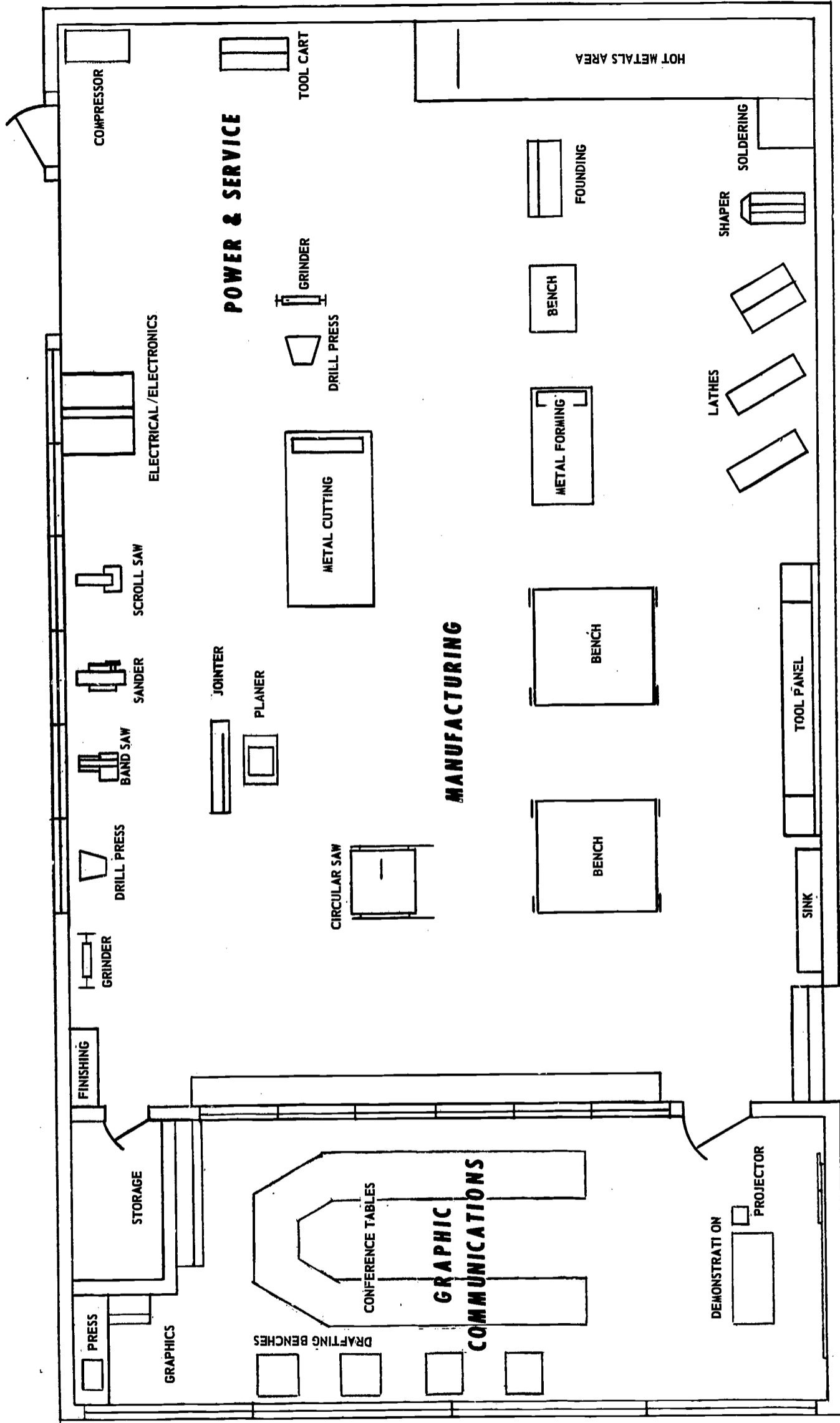
DID YOUR FATHER GO TO COLLEGE? \_\_\_\_\_

DID YOUR MOTHER GO TO COLLEGE? \_\_\_\_\_

WHAT HOBBIES DO YOU HAVE? \_\_\_\_\_

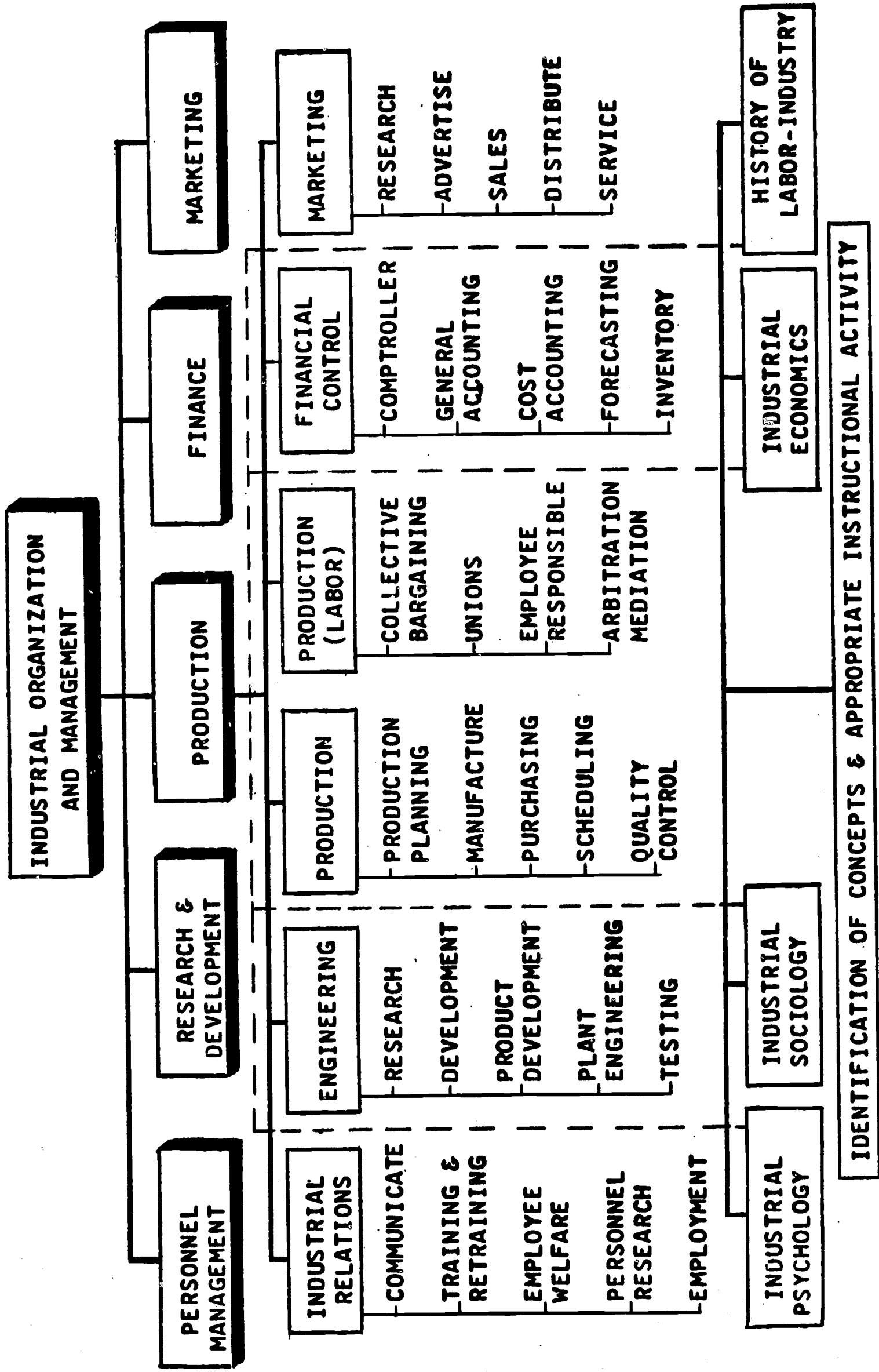
IN CASE OF EMERGENCY, WHO SHOULD BE NOTIFIED? \_\_\_\_\_

WHERE? \_\_\_\_\_



**LABORATORY OF INDUSTRIES**  
GORHAM STATE COLLEGE

# COMMON ELEMENTS OF INDUSTRY



**TOOLS AND EQUIPMENT:**

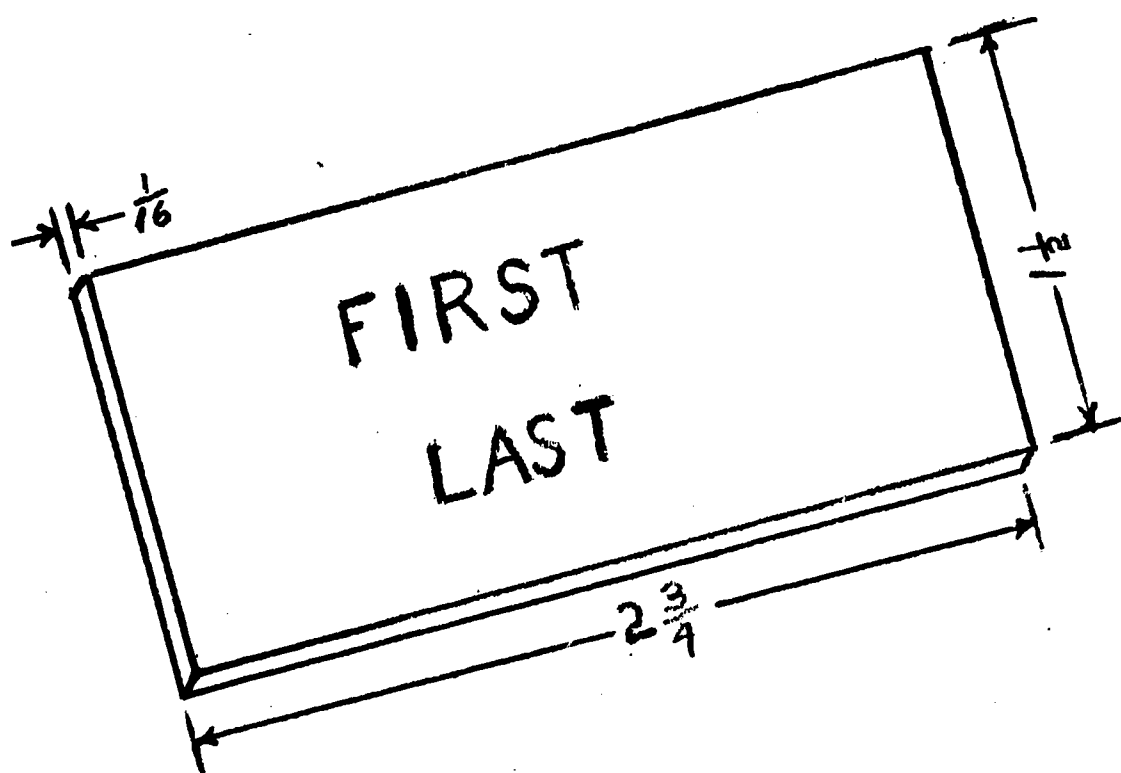
No special tools other than those common to the comprehensive general laboratory will be necessary to meet the objectives of this unit, including:

1. Overhead projector
2. Projectural screen

**MATERIALS AND SUPPLIES:**

1. Pencils
2. Aprons
3. Engraved phenolic strips
4. Pin backs
5. Household cement

# PUPIL NAMETAGS



## NOTE:

Pin clip fastened onto back with  
jewelry finding cement.

LESSONS TO BE TAUGHT:

Industrial Arts and its Relationship to Technology

An Overview of the Industrial Arts Program

Organization and Management of the Industrial Arts Laboratory

Title: Industrial Arts and Its Relationship to Technology

Presentation:

I. Industry: its importance

II. Industrial arts: a study of industry

A. History

1. Meaning of the term industrial arts
2. The manual training movement
3. The progressive education movement

B. Objectives, goals and purposes of industrial arts

1. Understanding industry
2. Skills
  - a. Design
  - b. Use of materials
  - c. Use of tools
  - d. Planning
  - e. Cooperation
3. Attitudes
  - a. Appreciation for accomplishment or achievement
  - b. The importance of the worker in our society
  - c. Appreciation for and understanding of industry and the part it plays in our culture

C. Purpose of industrial arts

1. Vocational
2. General educational
3. Health
4. Economical
5. Esthetic
6. Social

D. Relating industrial arts to industry

1. Laboratory - machines of industry
2. Involved in making things
3. Organization - student personnel system and how it relates to industry
4. Excursions - visits to industry
5. Intensive study of a particular industry - household accessories

REFERENCES:

American Council on Industrial Arts Teacher Education, A Historical Perspective of Industry, Chapter 1.

American Vocational Association, A Guide to Improving Instruction in Industrial Arts, Chapter 1.

Department of Education, State of Maine, Industrial Arts Technology, A Study of American Industry, pp. 1-5.

Delmar W. Olson, Industrial Arts and Technology, pp. 1-28, 31-60, 161-190.



Title: An Overview of the Industrial Arts Program

Presentation:

I. Class Introductory Material

A. Introduction of teachers to students

1. Who you are
2. Where you are from

B. Introduction of students to teachers and each other

C. Get information from students concerning what an employer should know

D. Complete student information cards

E. Students complete name tags to interest them in laboratory experiences

II. Industrial Arts Laboratory Procedures

A. Procedure on entering laboratory

1. Enter classroom
2. Seating assignments, if necessary
3. Presentation of lesson, if scheduled

B. Procedure on leaving the laboratory

1. Laboratory clean-up during final 10 minutes
2. Return to classroom
3. Dismissal when all is in order

References: None necessary

Title: Organization and Management of the Industrial Arts Laboratory

Presentation:

I. Safety

A. Industrial safety programs

1. Human costs
2. Medical costs
3. Compensation
4. Insurance costs
5. Lost production

B. Industrial arts laboratory safety

1. No horse play
2. Get permission before operating machines
3. Report accidents immediately
4. Wear proper clothing and eye protection
5. Return tools immediately
6. Be alert while using tools and machines

II. Laboratory tour

A. Introduction to the manufacturing panel

1. Tools they have at home
2. Common hand tools
  - a. uses
  - b. names
3. Tools of one type are grouped together
  - a. Cutting tools
  - b. Layout tools
  - c. Shaping and forming tools
  - d. Holding tools
  - e. Assembly tools
  - f. Drilling and boring tools

B. Machines and equipment the students will be permitted to use

1. Drill press
2. Box and pan brake
3. Forming rolls
4. Grinder
5. Scroll saw
6. Squaring shears

C. Other machines and equipment or areas

1. Circular saw
2. Jointer
3. Surface planer
4. Wood lathe
5. Engine lathe
6. Metal shaper
7. Hot metals area
8. Electricity area
9. Power and transportation area
10. Store room

D. Safety in the laboratory

1. Placement of machines
  - a. Metals equipment placement
  - b. Woods equipment placement
  - c. Safety lanes
2. Eye safety
  - a. All cutting machines require eye protection
  - b. Protection around the arc welding area

References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley,  
Manufacturing Organization and Management, p. 353

Chris H. Groneman and John L. Feirer, General Shop,  
pp. 67, 192

**UNIT EVALUATION:**

Observe pupils as they work to determine if behavior has  
been affected.

TITLE OF UNIT

HOUSEHOLD ACCESSORIES INDUSTRIES

TEACHING TEAM

DANIEL L. BREY  
GLEN O. HAYES  
RODNEY H. HOFFMAN  
RAY O. JONES  
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July 1 - August 9, 1968

## INTRODUCTION:

Industry - the instrument of society for the application of technology, has a continual effect on all individuals. Most of us take for granted the many household accessories which we encounter each day and which make our lives more convenient and comfortable.

With many millions of men and women gainfully employed by industries producing household accessories and since the importance of these products is easily recognized by beginning pupils who are generally familiar with them, this seems an appropriate area in which to begin a study of the manufacturing industries.

This unit, then, will bring into closer focus the role of these industries in our society and the many functions which are necessary for their success.

SCOPE:

This unit is intended to be used as a second teaching unit with boys and girls who have been introduced to the industrial arts program.

To accomplish the objectives of this unit, it is suggested that 9 weeks, or 24 hours, be allotted to adequately cover the information and experiences presented in or through this unit.

Activities and products shall be characteristic of the household accessories industries and will be limited to fabrication from sheet materials. Special emphasis will be placed upon the partnership type of ownership and the functions involved.

OBJECTIVE 1: To develop an understanding of an insight to the household accessories industries and their place in our society

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                               | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | TEACHER LESSONS                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <p>The pupil will be able to:</p> <ol style="list-style-type: none"> <li>1. Identify local industries which manufacture household accessories and recognize the effect of these on employment and the economy.</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. List several local household accessories industries</li> <li>b. Tour a local household accessories industry.</li> <li>c. Look through the yellow pages for names of household accessories industries.</li> <li>d. Look through local buyers guides for names of household accessories industries</li> <li>e. Look through catalogs for examples of products which are produced by household accessories industries.</li> </ol> | <p>Local Household Accessories Industries and their Effect on Employment and the Economy</p> |



OBJECTIVE 1: To develop an understanding of an insight to the household accessories industries and their place in our society (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                                                             | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | TEACHER LESSONS                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| <p>The pupils will be able to:</p> <p>2. List the types of jobs or employment opportunities in the household accessories industries</p> | <p>Have pupils:</p> <ul style="list-style-type: none"> <li>f. Visit local stores and identify manufactured household accessories.</li> <li>g. Discuss how money circulates through the economy</li> <li>h. Discuss how business uses its money.</li> <li>i. List raw materials, labor and markets needed for local household accessories industries.</li> </ul> <p>2. a. List the father's occupation</p> <p>b. Check through the local want ads for job classifications</p> <p>c. Tell what job he would like to do</p> | <p>Industrial Organization and Laboratory Personnel</p> |

**OBJECTIVE 1:** To develop an understanding of an insight to the household accessories industries and their place in our society (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | TEACHER LESSONS           |
|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <p>The pupils will be able to:</p> <p>3. Explain the differences in types of ownership</p> | <p>Have pupils:</p> <ul style="list-style-type: none"> <li>d. Select a job in the personnel organization</li> <li>e. Compare shop organization personnel with that of industry</li> </ul> <p>3. a. List types of ownership and differences in organization of the industries</p> <ul style="list-style-type: none"> <li>b. Establish themselves in teams as partners in business</li> <li>c. Examine telephone or other business directory and list three or more companies that fall into the partnership category</li> </ul> | <p>Types of Ownership</p> |

**OBJECTIVE 2:** To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                                                      | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEACHER LESSONS                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>1. Apply principles of design to products of these industries</li> <li>2. Follow logical procedure in selecting a product</li> <li>3. Make working sketches or drawings of selected product</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1.               <ol style="list-style-type: none"> <li>a. Look through appropriate catalogs for designs presently in use</li> <li>b. Identify design principles in sample accessories</li> </ol> </li> <li>2.               <ol style="list-style-type: none"> <li>a. Look through appropriate catalogs for product ideas</li> <li>b. Compare possible products</li> <li>c. Use criteria for production and marketing</li> </ol> </li> <li>3.               <ol style="list-style-type: none"> <li>a. Sketch the proposed product</li> <li>b. Examine industrial sketches or drawings for content</li> </ol> </li> </ol> | <p>Principles of Good Design</p> <p>Procedure in Selecting a Product</p> <p>Working Drawings and/or Sketches of Selected Products</p> |

**OBJECTIVE 2:** To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                    | PUPIL ACTIVITIES                                                                                                           | TEACHER LESSONS                               |
|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <p>The pupils will be able to:</p> <p>4. Analyze drawings or sketches for materials needed</p> | <p>Have pupils:</p> <p>4. a. Complete a bill of materials</p> <p>b. Compare stock list used in industry with their own</p> | <p>Selection of Materials</p>                 |
| <p>5. Analyze drawings or sketches for procedures and/or construction details</p>              | <p>5. a. Construct procedure list for individual product</p>                                                               | <p>Procedures and/or Construction Details</p> |
| <p>6. Recognize and/or obtain the materials selected</p>                                       | <p>6. a. Select materials for individual product</p> <p>b. Compare all sheet materials found in laboratory</p>             | <p>Obtaining and Recognizing Materials</p>    |
| <p>7. Recognize and use simple layout tools</p>                                                | <p>7. a. Locate layout tools in laboratory</p> <p>b. List simple layout tools</p>                                          | <p>Simple Layout Tools and Procedures</p>     |

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                        | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEACHER LESSONS                            |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| <p>The pupils will be able to:</p> <p>8. Recognize and use simple cutting tools and procedures</p> | <p>Have pupils:</p> <ul style="list-style-type: none"> <li>c. Use simple layout tools on selected products</li> <li>d. Demonstrate use of layout tools to classmates</li> <li>e. Prepare a report on history of layout tools</li> <li>f. Prepare a list of layout tools found in home workshop</li> </ul> <p>8. a. Locate cutting tools in laboratory</p> <p>b. List simple cutting tools</p> <p>c. Use simple cutting tools on selected product</p> | <p>Simple Cutting Tools and Procedures</p> |

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the household accessories industries and their related processes (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                                    | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TEACHER LESSONS                                        |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <p>The pupils will be able to:</p> <p>9. Recognize and use simple forming and shaping tools and procedures</p> | <p>Have pupil:</p> <ul style="list-style-type: none"> <li>d. Investigate local suppliers of cutting tools</li> <li>e. Prepare a price list of those cutting tools required in a home workshop</li> </ul> <p>9. a. Locate forming and shaping tools in laboratory</p> <p>b. List simple forming and shaping tools in laboratory</p> <p>c. Use simple forming and shaping tools on selected product</p> <p>d. View demonstration of forming and shaping tools on closed circuit TV</p> | <p>Simple Forming and Shaping Tools and Procedures</p> |

OBJECTIVE 2: To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                           | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                           | TEACHER LESSONS                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <p>10. Recognize and use simple holding tools and procedures</p> <p>11. Recognize and use simple assembly tools and procedures</p> | <p>Have pupils:</p> <p>9. e. Discuss with classmates types of tools and equipment used to form and shape materials</p> <p>10. a. Locate holding tools in laboratory</p> <p>b. Use simple holding tools on selected product</p> <p>c. Prepare a list of holding tools from a mail order catalog</p> <p>11. a. Locate assembly tools on manufacturing panel</p> <p>b. List simple assembly tools</p> <p>c. Use simple assembly tools on selected product</p> | <p>Simple Holding Tools and Procedures</p> <p>Simple Assembly Tools and Procedures</p> |

OBJECTIVE 2: To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                               | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                           | TEACHER LESSONS                         |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <p>The pupils will be able to:</p> <p>12. Recognize and use simple finishing equipment and procedures</p> | <p>Have pupils:</p> <p>11. d. Conduct experiment on strength of fasteners</p> <p>e. Prepare a report on kinds and types of assembly materials</p> <p>12. a. Locate finishing materials in laboratory</p> <p>b. Prepare a list of common finishes for sheet material</p> <p>c. Use simple finishing materials and techniques on selected product</p> <p>d. View film on finishing</p> <p>e. Complete questionnaire on film on finishing</p> | <p>Finishing Methods and Procedures</p> |



**OBJECTIVE 2:** To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

| EXPECTED BEHAVIORAL CHANGES                                                              | PUPIL ACTIVITIES                                                                                                                                                                               | TEACHER LESSONS                                  |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <p>The pupils will be able to:</p> <p>13. Inspect product and use testing procedures</p> | <p>Have pupils:</p> <p>13. a. Evaluate own product</p> <p>b. Compare industrial inspection techniques and relate to own product</p> <p>c. Prepare an inspection form for use in laboratory</p> | <p>Quality Control Procedures and Inspection</p> |
| <p>14. Recognize packaging, labeling and distribution procedures</p>                     | <p>14. a. Package and label his product</p> <p>b. Display typical packaging materials from industry</p> <p>c. Visit local gift shop and observe packaging and labeling</p>                     | <p>Marketing Procedures</p>                      |

OBJECTIVE 2: To develop skill in the use of the tools, machines and equipment of the household accessories industries and their related processes (continued)

| EXPECTED BEHAVIORAL CHANGES                                                                             | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                         | TEACHER LESSONS            |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <p>The pupils will be able to:</p> <p>15. Use pricing techniques to determine sale value of product</p> | <p>Have pupils:</p> <p>14. d. Discuss procedures used to get product to distribution centers or terminals</p> <p>15. a. Determine the material costs of his product</p> <p>b. Estimate hours needed to produce product</p> <p>c. Estimate selling price of product</p> <p>d. Compare selling price with similar industry-produced products</p> <p>e. Develop cost pricing charts for laboratory use.</p> | <p>(Included in Above)</p> |

**OBJECTIVE 3:** To develop desirable attitudes and respect for work, the worker, and for the products of the household accessories industries

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                                                | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | TEACHER LESSONS                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The pupil will be able to:</p> <ol style="list-style-type: none"> <li>1. Work cooperatively with members of his class</li> <br/> <li>2. Care for tools, equipment and facilities</li> <br/> <li>3. Observe safety standards, posters, signs, and regulations</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1.               <ol style="list-style-type: none"> <li>a. Participate in the personnel organization</li> <li>b. Assist others in their tasks</li> <li>c. Follow policies for laboratory operation</li> </ol> </li> <li>2.               <ol style="list-style-type: none"> <li>a. Return tools to panel when finished with them</li> <li>b. Clean up work area</li> <li>c. Participate in personnel organization</li> </ol> </li> <li>3.               <ol style="list-style-type: none"> <li>a. Prepare items for a safety bulletin board</li> <li>b. Observe a safety film</li> <li>c. Observe safety signs on machines</li> <li>d. Wear proper safety clothing and use safety devices</li> </ol> </li> </ol> | <p>Industrial Organization and Laboratory Personnel System</p><br><p>(Include in each lesson when applicable)</p><br><p>Safety in Industry and the Industrial Arts Laboratory</p> |

APPROACH:

1. Discuss with pupils what household accessories are.
2. Display some household scenes showing accessories.
3. Visit a store that sells household accessories and identify manufactured products.
4. Show various materials and discuss how industry uses these to design and produce household accessories.
5. Visit a local industry which manufactures household accessories.

## RESOURCE MATERIALS:

### A. REFERENCE AND RESEARCH MATERIALS:

- Amrine, Harold T.; Ritchey, John A.; Hulley, Oliver S.,  
Manufacturing: Organization and Management, Englewood  
Cliffs, N. J.: Prentice-Hall, Inc., 1966.
- Feirer, John L., Advanced Woodwork and Furniture Making,  
Peoria, Illinois: Charles A. Bennett Publishers, 1954.
- Feirer, John, Woodworking for Industry, Peoria, Illinois:  
Charles A. Bennett Company, Inc., 1965.
- Feirer, John and Lindbeck, John, Industrial Arts Metalwork,  
Peoria, Illinois: Charles A. Bennett Company, Inc., 1965.
- Fryklund, Verne C., General Shop Woodworking, Bloomington,  
Illinois: McKnight and McKnight, 1963.
- George, Claude S., Jr., Management in Industry, Englewood  
Cliffs, N. J.: Prentice-Hall, Inc., 1959.
- Gerbracht, Carl and Robinson, Frank E., Understanding  
America's Industries, Bloomington, Illinois: McKnight  
and McKnight Publishing Company, 1962.
- Gibia, S. W., Wood Finishing and Refinishing, Princeton,  
N. J.: D. Van Nostrand Publishers, 1954.
- Groneman, Chris H., General Woodworking, New York: McGraw-  
Hill Book Company, Inc., 1959.
- Groneman, Chris H. and Feirer, John L., General Shop, New  
York: McGraw-Hill Book Company, Inc., 1963.
- Hjorth, Herman, Basic Woodworking Processes, Milwaukee,  
Wisconsin: Bruce Publishing Company, 1961.
- Madden, Ira C., Woodworking for Industrial Arts, Chicago:  
Goodheart-Willcox Company, Inc., 1959.
- Newell, Adnah Clifton and William F. Holtrop, Coloring and  
Painting Wood, Peoria, Illinois: Charles A. Bennett Company,  
Inc., 1961.
- Schaaff, Robert, Complete Book of Wood Finishing, New York:  
McGraw-Hill Book Company, Inc., 1956.
- State University of New York, Oswego, Field Study in Industry  
for the Preparation of Industrial Arts Teachers.
- Wagner, Willis H., Woodworking, Chicago, Illinois: Goodheart  
Willcox Company, Inc., 1961.

A. REFERENCE AND RESEARCH MATERIALS (Continued):

Waring, Ralph G., Modern Wood Finishing, Milwaukee: Bruce Publishing Company, 1963.

B. TEACHING AIDS AND DEVICES

Chalkboard and chalk

Catalog pictures of household accessories

Samples of household accessories

Sample packages for household accessories

Samples of materials available for pupil use

Film, Wood Finishing, 16 mm, sound film, McGraw-Hill Book Company, 330 West 42nd Street, New York, New York 10030

Book rack sketch

Dollar bill sample (sales)

Film questions

Transparencies

Manufacturing -- factors for success

Business ownership and control

Sole proprietorship

Partnership

Business corporation

Formation of corporations

Management of corporation

Levels of flow of authority

Functions of industrial relations

Application blank for factory workers

Selection and employment procedure

Typical path of a research project

Three groupings of engineering functions

Research and development

Derivation of basic cost elements

Cost analysis and process chart

Flow process chart

Scheduling of a job order

Typical standard route chart

Typical job ticket

How production control in the Ford Motor Company relates to other activities

Development of the total cost of a product

Industrial Arts Product Evaluation Sheet

Control procedures

Employee appraisal  
Grievance forms  
Marketing functions  
Stock certificate  
Marketing sub-functions  
Components of cost  
Relation of cost to profit  
Total cost and selling price of a product  
Functions of financial control  
How to read financial page of a newspaper

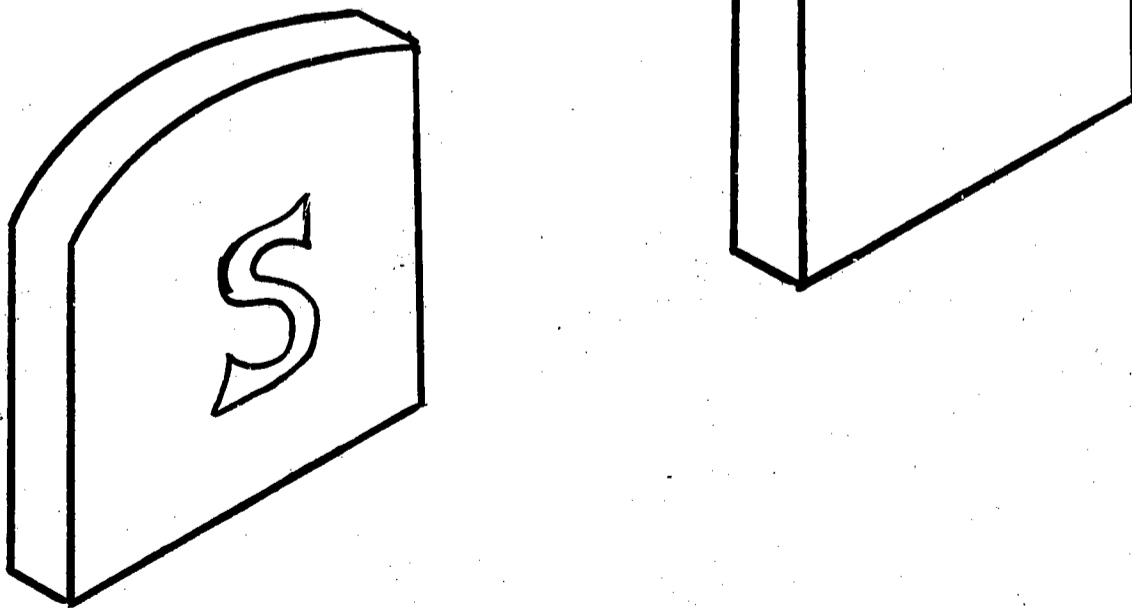
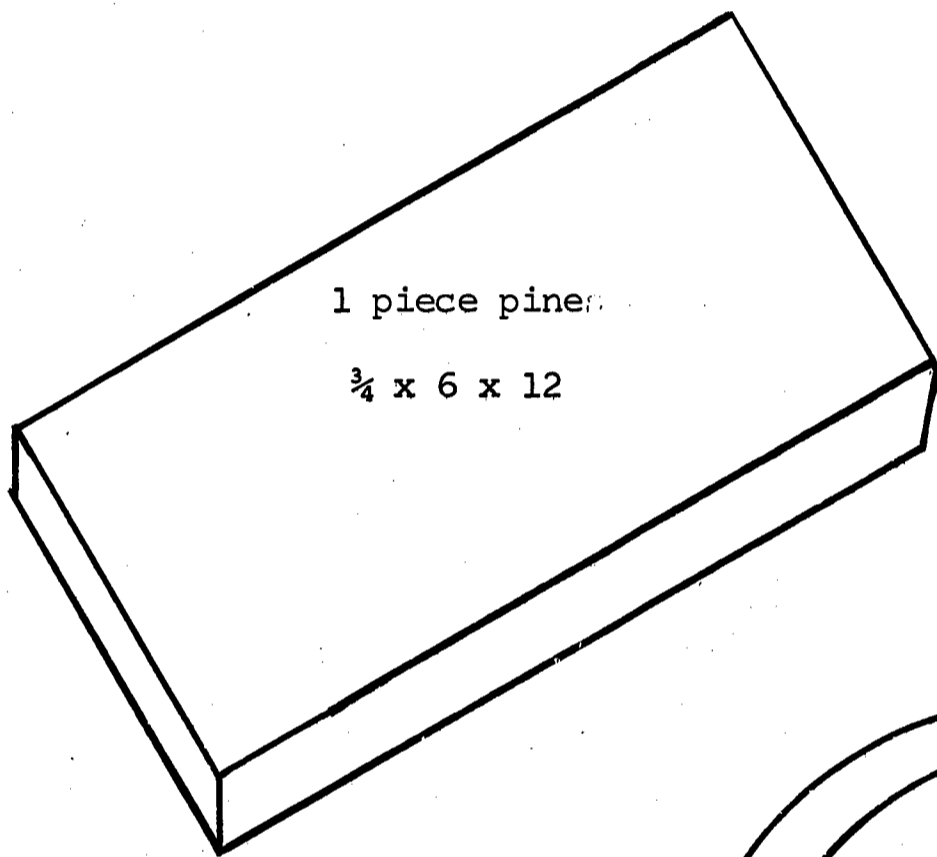
BOOK RACK

Idea developed through lessons:

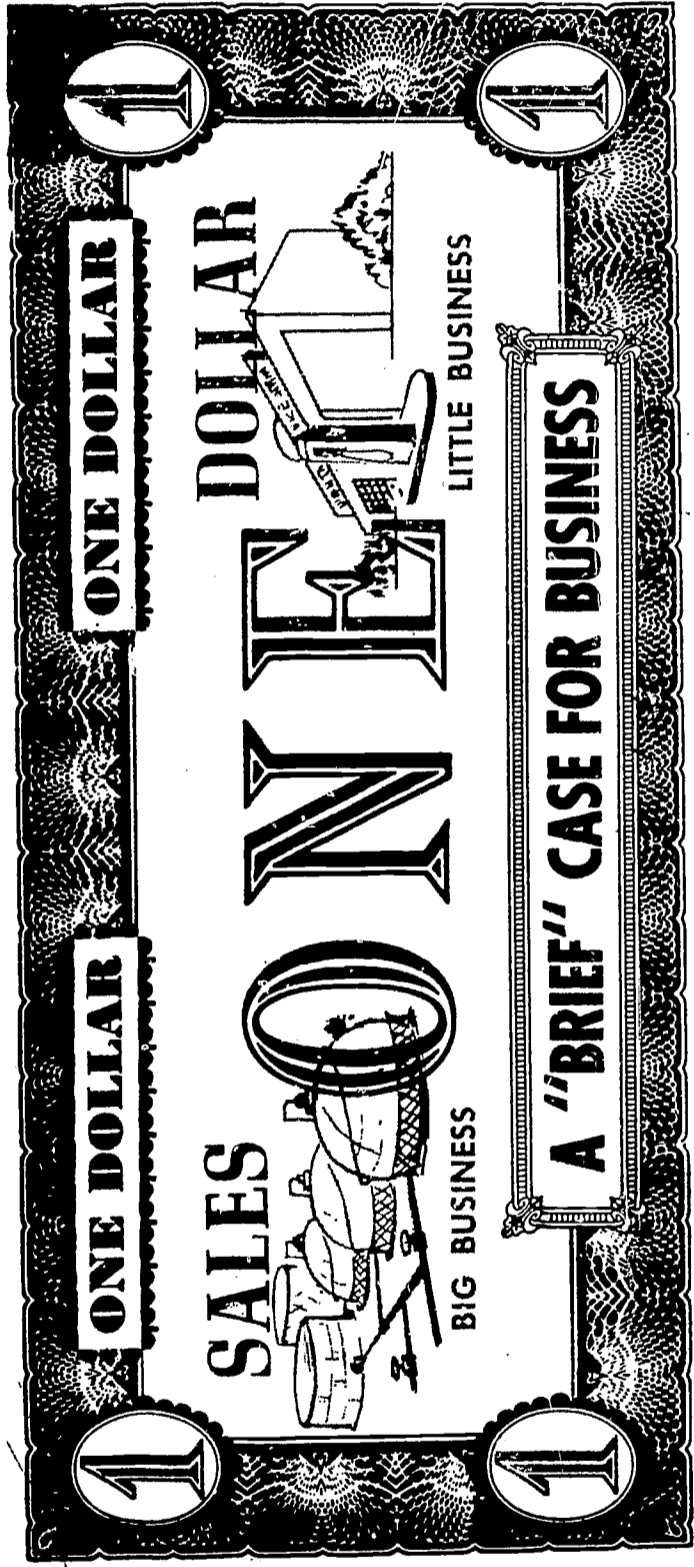
Procedure in Selecting a Product

Principles of Good Design

Making Working Drawings and/or Sketches of Selected Projects







|          |     |
|----------|-----|
| DIVIDEND |     |
| TAXES    |     |
| TOOLS    | 3%  |
| WAGES    | 26% |
| SUPPLIES | 58% |
| LEFT     |     |

FILM QUESTIONS:

Answer the following from the film:

1. Tell how to seal in rosin.
2. The best finish to show natural grain is \_\_\_\_\_.
3. Three kinds of stain are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
4. Why is it necessary to test stains first?
5. How should the end grain be treated?
6. What should be stained first?
7. What direction should you apply the stain?
8. Hardwoods or close grain woods should be sealed with \_\_\_\_\_.

# MANUFACTURING - FACTORS FOR SUCCESS

MONEY: A PREREQUISITE TO A MANUFACTURING OPERATION. NECESSARY TO PROVIDE THE PLANT AND EQUIPMENT, TO PURCHASE RAW MATERIALS, AND TO MEET PAYROLLS UNTIL SUCH A TIME THAT THERE IS INCOME FROM THE SALE OF PRODUCTS.

MACHINES: INCLUDES ALL PRODUCTION FACILITIES SUCH AS BUILDINGS, TOOLS, EQUIPMENT, AS WELL AS MACHINES IN THE STRICT SENSE. THESE ARE THE TOOLS OF PRODUCTION.

MATERIALS: THOSE THINGS THAT BECOME A PART OF THE FINISHED PRODUCT OFFERED FOR SALE OR THAT ARE USED IN THE MANUFACTURE OF THAT PRODUCT.

MEN: THOSE PEOPLE IN THE MANUFACTURING CONCERN WHO USE THE MACHINES AND MATERIALS PROVIDED TO MAKE THE PRODUCT.

METHODS: INTEGRATORS OF MACHINES, MATERIALS, AND MEN.

MARKETS: THE MEANS BY WHICH A COMPANY SECURES INCOME, NOT ONLY TO PAY FOR THE COST OF THE FACTORS DESCRIBED SO FAR, BUT ALSO TO PROVIDE A PROFIT.

MANAGEMENT: THE FUNCTION OF PLANNING, ORGANIZING, DIRECTING, AND CONTROLLING.

## BUSINESS OWNERSHIP AND CONTROL

### 5 BASIC FORMS

- 3 HAVE PROFIT MOTIVE AND RUN FREELY
- 1 IS NON-PROFIT AND OPERATES FREELY
- 1 IS GOVERNMENT OPERATED, NON-PROFIT

THOSE THAT OPERATE FOR A PROFIT ARE THE:

- A. SOLE PROPRIETORSHIP
- B. PARTNERSHIP
- C. BUSINESS CORPORATION

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-69.

## SOLE PROPRIETORSHIP

### ADVANTAGES:

1. EASY TO FORM
2. EASY TO DISSOLVE
3. CONTROL AND DECISIONS BY INDIVIDUAL
4. ALL PROFITS TO OWNER
5. TAX BENEFITS OVER CORPORATION

### DISADVANTAGES:

1. DIFFICULT TO ENLARGE - NOT ENOUGH CAPITAL
2. CREDITORS CAN ATTACH PERSONAL PROPERTY
3. MUST RELY ON OWN SKILL AND ABILITY
4. BUSINESS DIES AT DEATH OF OWNER

STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-70.

## PARTNERSHIP

### ADVANTAGES:

1. GREATER CAPITAL
2. MORE BORROWING POWER
3. COMBINATIONS OF TALENT WITH SIMILAR INCENTIVES
4. SOME TAX ADVANTAGES OVER CORPORATION

### DISADVANTAGES:

1. CREDITORS CAN ATTACH PERSONAL PROPERTY OF ANY PARTNER
2. CAN'T WILL RIGHTS WITHOUT CONSENT OF ALL CONCERNED
3. DISAGREEMENT EASY BETWEEN PARTNERS
4. DEATH OF THE FIRM WHEN ANY PARTNER DIES

## THE BUSINESS CORPORATION

THE BUSINESS CORPORATION IS AN ARTIFICIAL BEING, INVISIBLE, INTANGIBLE, AND EXISTING ONLY IN THE EYES OF THE LAW. THE CORPORATION POSSESSES THE POWERS TO:

1. OWN PROPERTY
2. ENTER INTO CONTRACT
3. TO SUE
4. TO BE SUED

## FORMATION OF CORPORATIONS

1. GENERALLY A MINIMUM OF THREE PEOPLE
2. THEY APPLY TO THE STATE IN WHICH THEY WILL DO BUSINESS. THE APPLICATION WILL GENERALLY CONTAIN THE FOLLOWING:
  - A. NAMES OF BOARD OF DIRECTORS
  - B. OBJECTIVES
  - C. MAXIMUM NUMBER OF SHARES OF CAPITAL STOCK
  - D. CLASSES OF STOCK
  - E. VALUE OF THE STOCK
  - F. METHODS OF STOCK TRANSFER
  - G. PRINCIPAL PLAN OF THE BUSINESS
  - H. POWER, RIGHTS AND PRIVILEGES OF THE STOCKHOLDERS

### NOTE:

THE ACTUAL REQUIREMENTS WILL VARY FROM STATE TO STATE.



## MANAGEMENT OF CORPORATION

THE CORPORATION IS OWNED BY THE STOCKHOLDERS BUT MANAGED BY THE BOARD OF DIRECTORS WHO ARE ELECTED BY THE STOCKHOLDERS.

## OWNERSHIP OF THE CORPORATION

STOCKHOLDERS OWN THE CORPORATION, BUT THEY SHARE IN THE PROFITS ONLY AFTER ALL PRIOR LIENS HAVE BEEN MET.

## LEVELS AND FLOW OF AUTHORITY

Ultimate authority  
and control

Stockholders

Policy Formation

Board of Directors

Immediate and effective  
authority and control

President

Geographic and functional  
activity and control

Vice Presidents  
or equivalent

Integration of  
operations

Division Plant  
or Unit Heads

Supervision of  
operations

Department Heads

Performance of  
operations

Operatives

WHEELER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 144.

# FUNCTIONS OF INDUSTRIAL RELATIONS

DEVELOPING AND ADMINISTERING POLICIES AND PROGRAMS FOR PROVIDING AN EFFECTIVE ORGANIZATIONAL STRUCTURE, SECURING EMPLOYEES, IMPROVING THEIR PRODUCTIVITY, PROVIDING ADEQUATE COMPENSATION AND GENERAL WELFARE, AND PROVIDING AN EFFECTIVE COMMUNICATIONS PROGRAM.

**EMPLOYMENT:** INSURING THAT ALL POSITIONS ARE FILLED BY COMPETENT PERSONNEL EFFICIENTLY.

**WAGE & SALARY ADMINISTRATION:** INSURING THAT ALL EMPLOYEES ARE FAIRLY AND EQUITABLY COMPENSATED.

**EMPLOYEE RELATIONS:** INSURING THAT ALL WORKING RELATIONSHIPS BETWEEN MANAGEMENT AND EMPLOYEES AND THE JOB SATISFACTION OF AND WORK OPPORTUNITIES FOR THE COMPANY'S PERSONNEL ARE DEVELOPED AND MAINTAINED IN THE BEST INTERESTS OF THE COMPANY AND ITS EMPLOYEES.

**ORGANIZATION PLANNING AND DEVELOPMENT:** INSURING THAT THE COMPANY IS EFFECTIVELY ORGANIZED AND CAPABLY STAFFED.

**EMPLOYEE SERVICES:** MAINTAINING THE GENERAL WELFARE OF EMPLOYEES AND ASSISTING THEM WITH PROBLEMS RELATED TO THEIR SECURITY AND PERSONAL WELL-BEING.

DEVELOPED BY STAFF  
STATE UNIVERSITY OF NEW YORK, OSWEGO, FIELD STUDY IN INDUSTRY-----, P. C-160.

# APPLICATION FOR EMPLOYMENT

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 7 | 0 | 0 | 4 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|

Print your name in full: \_\_\_\_\_  
First Middle (Married women use maiden name here) Last

Street Address \_\_\_\_\_ Nearest telephone \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Social Security Number \_\_\_\_\_

How long at this address \_\_\_\_\_

Age \_\_\_\_\_ Date of Birth \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_  
(Mo.) (Day) (Year)

Trade or occupation? \_\_\_\_\_  
 Other work you can do: (1) \_\_\_\_\_  
 " (2) \_\_\_\_\_

Wages expected? \_\_\_\_\_

Married? \_\_\_\_\_ Single? \_\_\_\_\_ Widowed? \_\_\_\_\_ Divorced? \_\_\_\_\_  
Sex \_\_\_\_\_ Sports; Hobbies? \_\_\_\_\_

Number of children \_\_\_\_\_ List other dependents \_\_\_\_\_ Have you any physical defects? What? \_\_\_\_\_ How many days have you lost by illness in past 2 years? \_\_\_\_\_

Were you ever employed by this Company? \_\_\_\_\_ Names of relatives or friends working here \_\_\_\_\_

| EDUCATION                           | Name of school | Location | Years attended | Years completed | Graduated? |
|-------------------------------------|----------------|----------|----------------|-----------------|------------|
| Grammar School                      | _____          | _____    | 19__ to 19__   | _____           | _____      |
| High school                         | _____          | _____    | 19__ to 19__   | _____           | _____      |
| Other education or special training | _____          | _____    | 19__ to 19__   | _____           | _____      |

I declare and warrant that the answers made herein are correct and true and that I am willing to undergo a physical examination and be fingerprinted.

**THE PROCTER & GAMBLE COMPANY**  
**THE PROCTER & GAMBLE MANUFACTURING COMPANY** (Signed) \_\_\_\_\_ (Date) \_\_\_\_\_  
 (SEE OVER)

**RECORD OF EMPLOYMENT:** Are you now employed? \_\_\_\_\_ If not, how long have you been unemployed? \_\_\_\_\_  
 Beginning with your present or last position, record below complete details of your experience.

| From | To | Employer | Address | Wage | Duties | Reason for leaving |
|------|----|----------|---------|------|--------|--------------------|
|      |    |          |         |      |        |                    |
|      |    |          |         |      |        |                    |
|      |    |          |         |      |        |                    |
|      |    |          |         |      |        |                    |
|      |    |          |         |      |        |                    |
|      |    |          |         |      |        |                    |
|      |    |          |         |      |        |                    |

What is the best job you have ever had? Employer: \_\_\_\_\_ Address: \_\_\_\_\_ Occupation: \_\_\_\_\_

Service in U. S. Armed Forces? \_\_\_\_\_ Branch of Service \_\_\_\_\_ / Rate or Rank \_\_\_\_\_ Date from \_\_\_\_\_ 19\_\_ to \_\_\_\_\_ 19\_\_ Type of Discharge \_\_\_\_\_

**APPLICANT WILL NOT USE THIS SPACE**

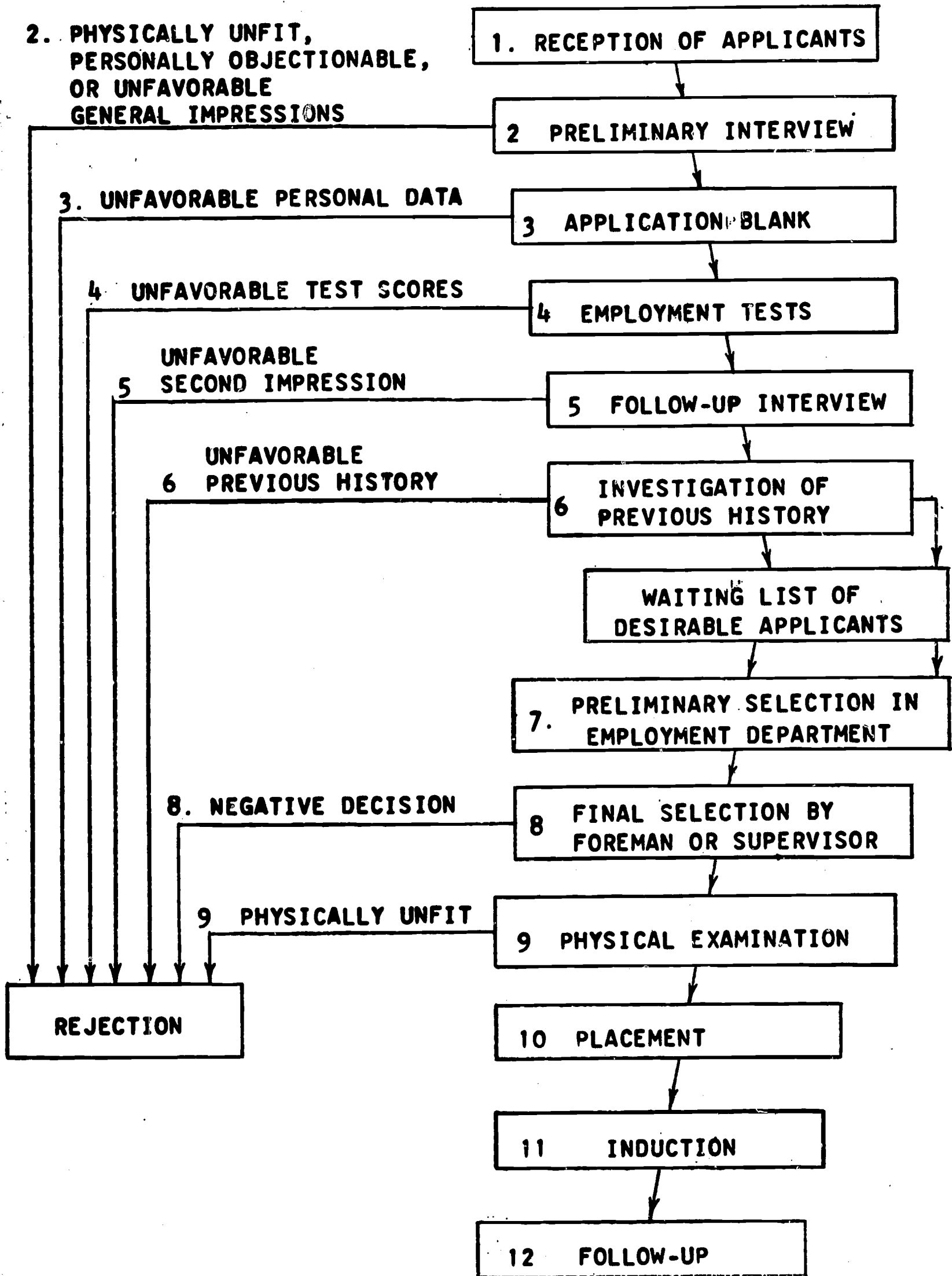
Remarks: \_\_\_\_\_

Date: \_\_\_\_\_ Signed: \_\_\_\_\_

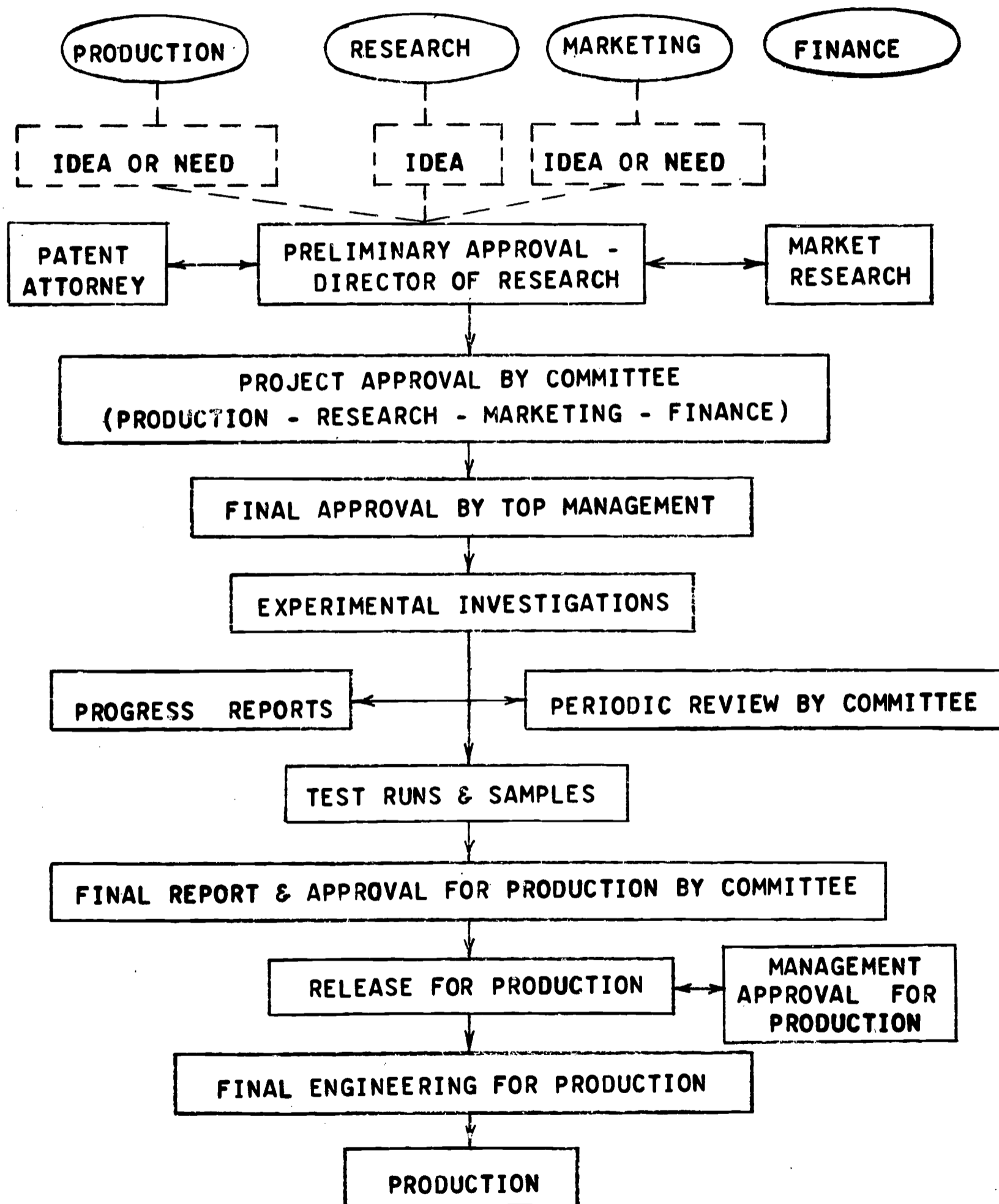
|               |  |
|---------------|--|
| <b>FORM</b>   |  |
| Selec. Form 1 |  |
| Cler.         |  |
| C             |  |

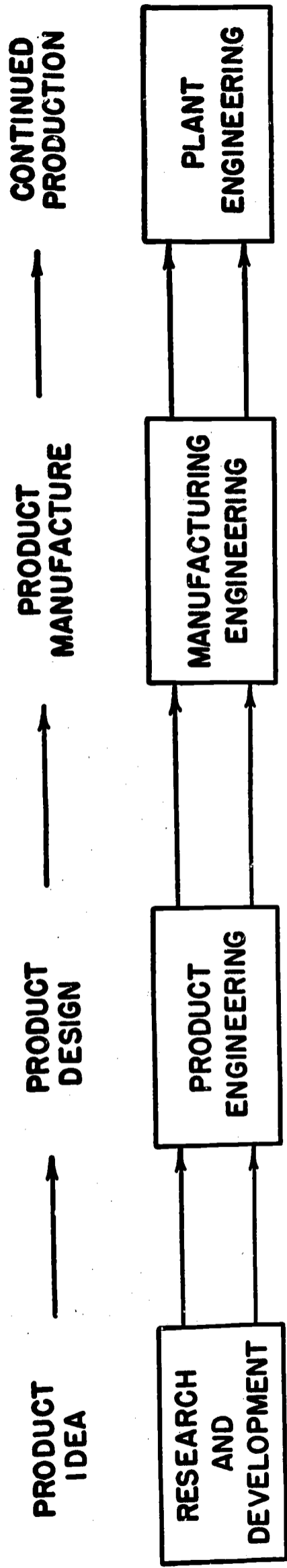
Figure 18-2. Application blank for factory workers. (Courtesy Procter & Gamble Co.)

# SELECTION and EMPLOYMENT PROCEDURE



# TYPICAL PATH OF A RESEARCH PROJECT - IDEA TO PRODUCTION





- |                                                                                                                         |                                                                                                                                                                                                               |                                                                                                                                                                                                                                      |                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. PURE RESEARCH</li> <li>2. APPLIED RESEARCH</li> <li>3. PILOT PLANT</li> </ol> | <ol style="list-style-type: none"> <li>1. DESIGN OF COMPONENTS</li> <li>2. PREPARATION OF SPECIFICATIONS</li> <li>3. PRODUCT STANDARDS</li> <li>4. PRODUCT TESTING</li> <li>5. ENGINEERING SERVICE</li> </ol> | <ol style="list-style-type: none"> <li>1. DESIGN OF PROCESSES</li> <li>2. TOOLING AND EQUIPMENT</li> <li>3. METHODS</li> <li>4. LAYOUT AND MATERIALS HANDLING</li> <li>5. QUALITY CONTROL</li> <li>6. ECONOMIC EVALUATION</li> </ol> | <ol style="list-style-type: none"> <li>1. INSTALLATIONS</li> <li>2. PLANT SERVICES</li> <li>3. MAINTENANCE</li> <li>4. SAFETY</li> </ol> |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|

Three groupings of the engineering functions in manufacturing.

ARMENI AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 437.

# RESEARCH AND DEVELOPMENT

APPLYING THE PROCESSES, OPERATIONS AND TECHNIQUES OF SCIENCE AND TECHNOLOGY TO CREATE PRODUCTS, PROCESSES, AND SERVICES WHICH MAY BENEFIT AN ENTERPRISE.

## FUNCTIONS:

**RESEARCH:** EXPLORING NATURE SCIENTIFICALLY FOR THE PURPOSE OF INCREASING KNOWLEDGE OF THE UNIVERSE.

**DEVELOPMENT:** APPLYING SCIENTIFIC AND TECHNOLOGIC KNOWLEDGE TO CREATE NEW OR MODIFY EXISTING PRODUCTS AND PROCESSES SO THEY WILL BEST ACHIEVE STATED PERFORMANCE AND ECONOMIC REQUIREMENTS.

**PRODUCT ENGINEERING:** SPECIFYING, INTERPRETING, AND MODIFYING FOR MANUFACTURING AND MARKETING PURPOSES THE NATURE, PERFORMANCE, AND QUALITY CHARACTERISTICS OF PRODUCTS.

MAYNARD, COMMON BODY OF KNOWLEDGE, CHART III.



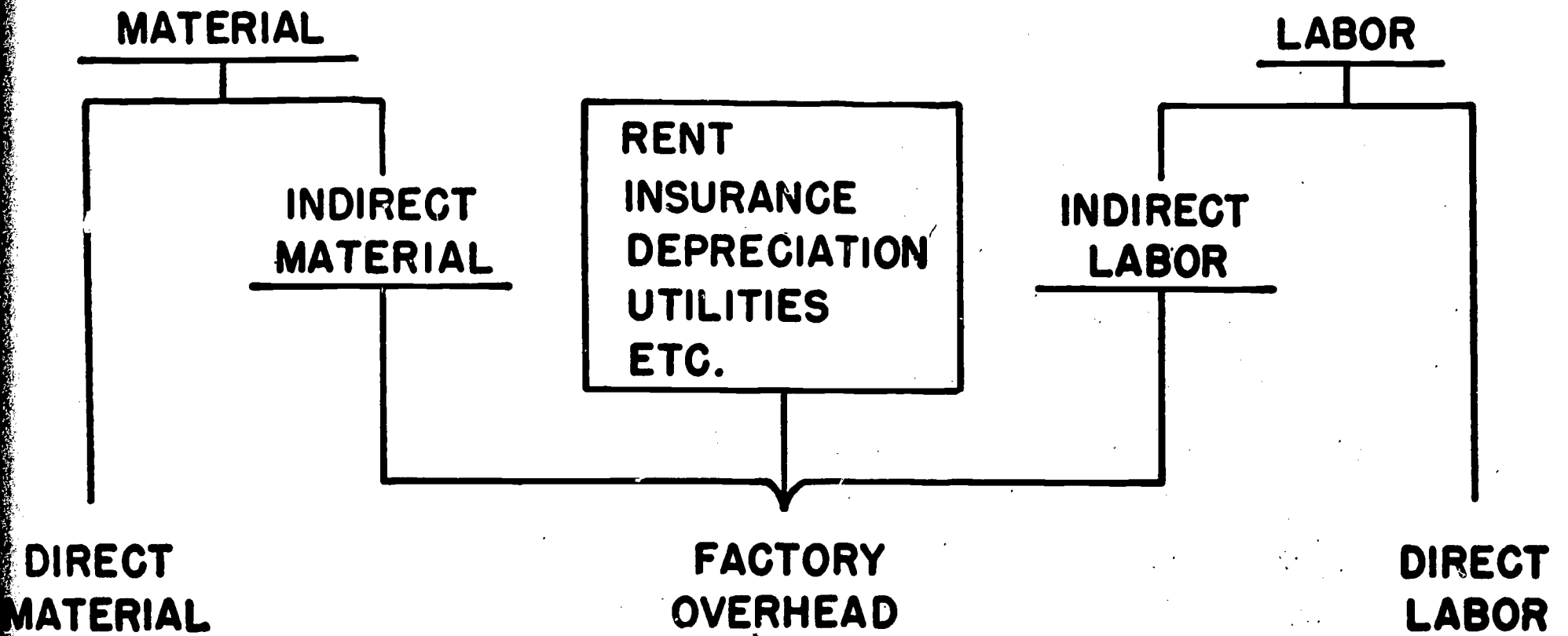


Figure 17-1. Derivation of basic cost elements.

Amrine, Ritchey & Hulley. Manufacturing Organization & Management. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1966.

## COST ANALYSIS & PROCESS CHART

PRODUCT NAME \_\_\_\_\_

WORKER'S NAME \_\_\_\_\_ DATE STARTED \_\_\_\_\_

DIRECTOR'S O.K. (Teachers) \_\_\_\_\_ DATE COMPLETED \_\_\_\_\_

### MATERIALS NEEDED FOR PRODUCTION

| Number of Pieces            | Description of Material | Size | Cost |
|-----------------------------|-------------------------|------|------|
|                             |                         |      |      |
|                             |                         |      |      |
|                             |                         |      |      |
|                             |                         |      |      |
|                             |                         |      |      |
|                             |                         |      |      |
|                             |                         |      |      |
| <b>Total Materials Cost</b> |                         |      |      |

### PRODUCTION & TOOL ROUTING

| Operation Number | Operation Description | Machine or Tool Used | Minutes per Operation |
|------------------|-----------------------|----------------------|-----------------------|
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |
|                  |                       |                      |                       |

### FLOW PROCESS CHART

DEPARTMENT 127  
 OPERATION Machining collar  
 ITEM CHARTED Collar NO. 80-352  
 CHARTED BY E.S.T. DATE \_\_\_\_\_

**SUMMARY**

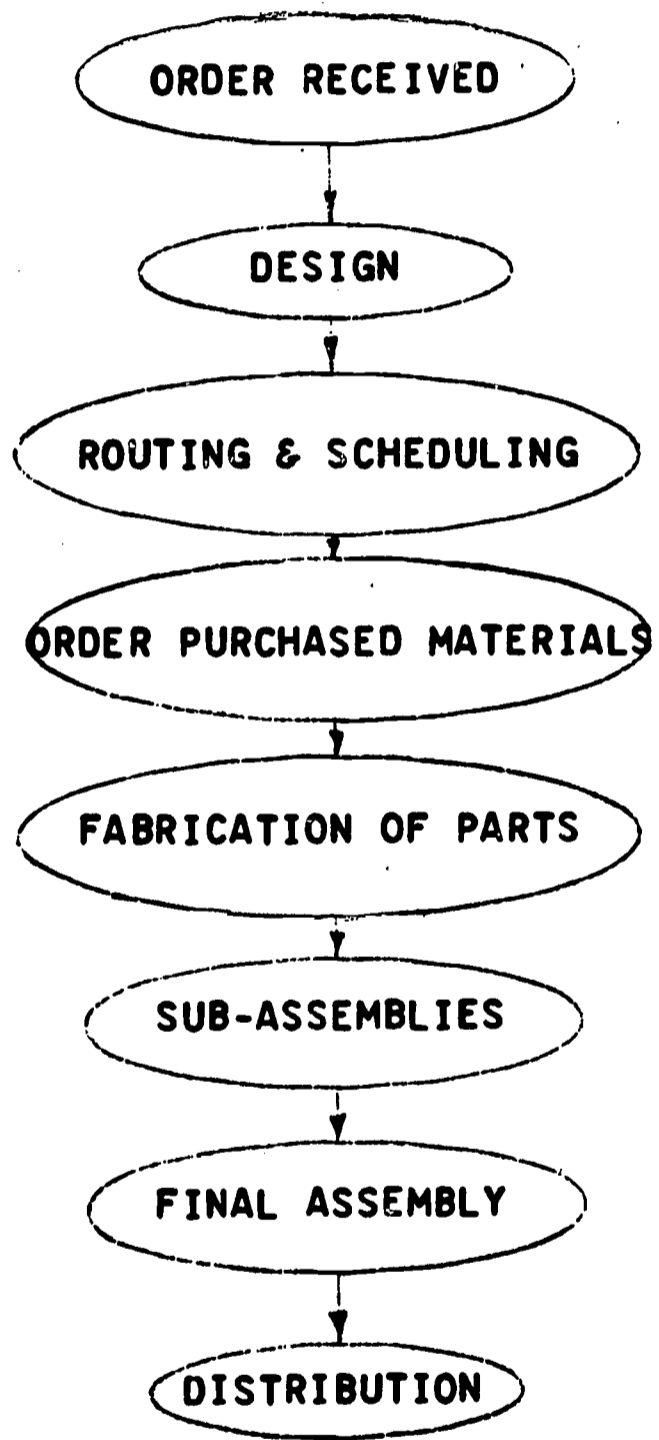
|                    | PRESENT |      | PROPOSED |      | DIFFERENCE |      |
|--------------------|---------|------|----------|------|------------|------|
|                    | NO.     | TIME | NO.      | TIME | NO.        | TIME |
| ○ OPERATIONS       | 5       |      |          |      |            |      |
| ◇ TRANSPORTATIONS  | 4       |      |          |      |            |      |
| □ INSPECTIONS      | 0       |      |          |      |            |      |
| ○ DELAYS           | 5       |      |          |      |            |      |
| ▽ STORAGES         | 0       |      |          |      |            |      |
| DISTANCE TRAVELLED | 200     | FT.  |          | FT.  |            | FT.  |

| DETAILS OF (PRESENT) METHOD   | ANALYSIS |   |   |   |     |    |   |   |   |   | NOTES | ACTION                          |  |
|-------------------------------|----------|---|---|---|-----|----|---|---|---|---|-------|---------------------------------|--|
|                               | ○        | ◇ | □ | ○ | ○   | ○  | ○ | ○ | ○ | ○ |       |                                 |  |
| 1 In storage rack             | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       | Can rack be located nearer saw? |  |
| 2 Attached to hoist           | ○        | ◇ | □ | ○ | 1   |    |   |   |   |   |       |                                 |  |
| 3 Moved to saw                | ○        | ◇ | □ | ○ | 15  | 1  |   |   |   |   |       |                                 |  |
| 4 Unloaded from hoist         | ○        | ◇ | □ | ○ | 1   |    |   |   |   |   |       |                                 |  |
| 5 Cut to length               | ○        | ◇ | □ | ○ | 1   |    |   |   |   |   |       |                                 |  |
| 6 Await move man              | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       | Can conveyor be used?           |  |
| 7 To lathe # 16               | ○        | ◇ | □ | ○ | 35  | 36 |   |   |   |   |       |                                 |  |
| 8 Await lathe operator        | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 9 Face end, turn seat of thro | ○        | ◇ | □ | ○ | 1   |    |   |   |   |   |       |                                 |  |
| 10 Await move man             | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 11 To lathe # 17              | ○        | ◇ | □ | ○ | 20  | 36 |   |   |   |   |       |                                 |  |
| 12 Face end of turn shoulder  | ○        | ◇ | □ | ○ | 1   |    |   |   |   |   |       | Is shoulder necessary?          |  |
| 13 Await move man             | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 14 To assembly dept.          | ○        | ◇ | □ | ○ | 130 | 36 |   |   |   |   |       |                                 |  |
| 15                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 16                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 17                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 18                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 19                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 20                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 21                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 22                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 23                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 24                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |
| 25                            | ○        | ◇ | □ | ○ |     |    |   |   |   |   |       |                                 |  |

Figure 7-2. Flow process chart for present method of manufacturing a steel collar.

Amrine, Ritchey & Hulley. Manufacturing Organization & Management. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1966.

## Scheduling of Job Order



MACNIECE, PRODUCTION FORECASTING, PLANNING AND CONTROL, P. 215.

SPECIAL MFG. CO.

## PRODUCTION AND MACHINE TOOL ROUTING

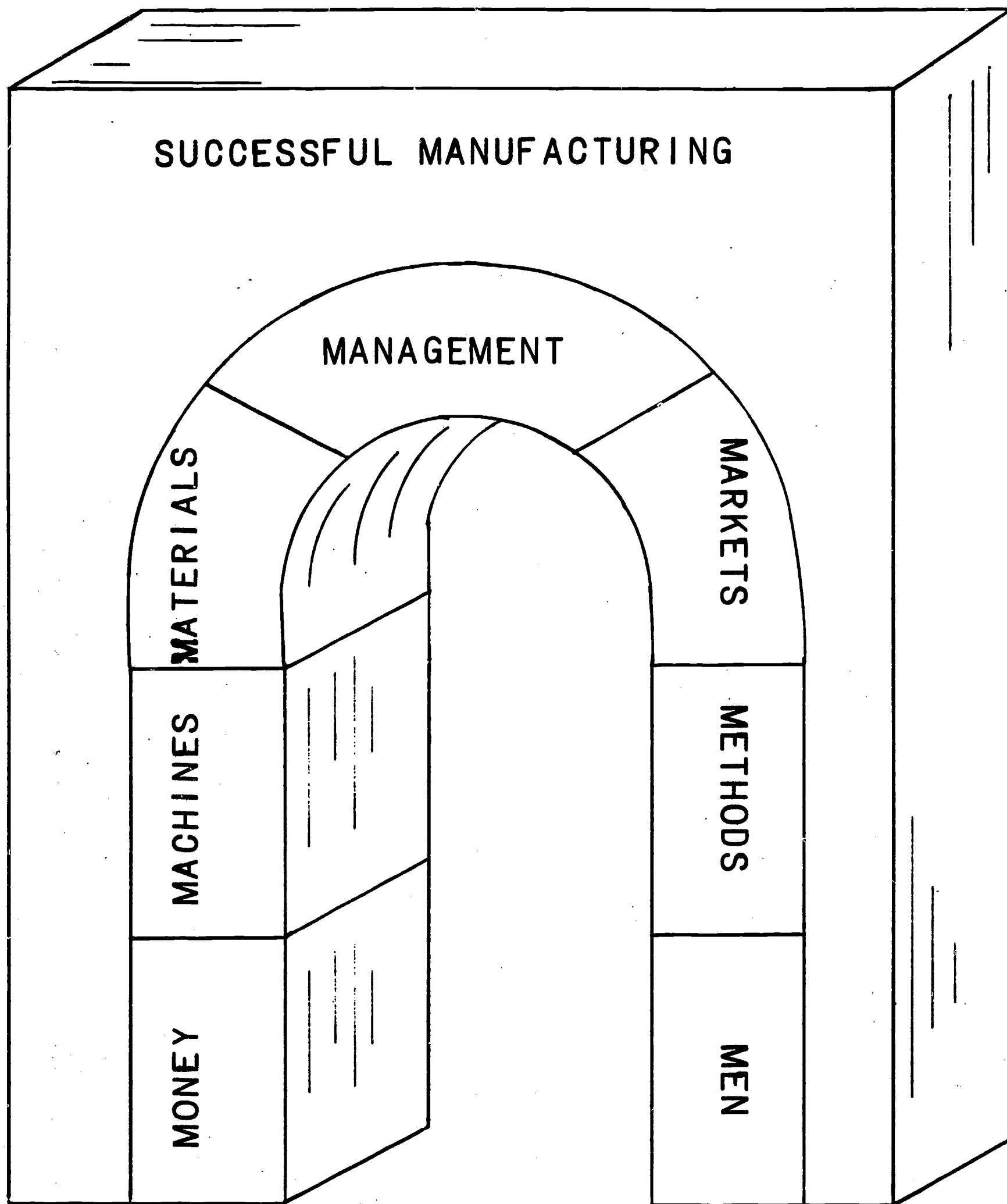
MIDWEST, IND.

PART NAME Cover - Gear Housing PART NO. 72845MATERIAL Cast Iron ROUGH SIZE As Cast ROUGH WEIGHT 3 pounds DATE EFFECTIVE 8/15/66MODEL B-33 QUANTITY PER ASSEMBLY 1 SHEET NO. 1 OF 1

| OP. NO.  | DEPT. NO.                | OPERATION NAME                                                                                                                                                                                                                                                                                                                                                                                                                                         | MACHINE NAME                                                         | MACH. NO. | TOOLS & GAGES                                                                                                                                                                                                                                                                                                                                                                                                                                  | TOOL NO.                                                                                                     | GROUP NO. | REQ. NO.       | STD. TIME |                | CAP. EACH MACH. PER HOUR |     |
|----------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------|----------------|-----------|----------------|--------------------------|-----|
|          |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                      |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                              |           |                | MINS.     | HRS.           |                          |     |
|          | 307                      | Receive                                                                                                                                                                                                                                                                                                                                                                                                                                                | Receiving Dept.                                                      |           | (1) Foundry Insp. Fixture<br>(1) Cutter Driver<br>(2) Cutter<br>(1) Receiving Insp. Fixture<br>(1) Tool Layout<br>(1) Face Plate Fixture<br>(1) Tool Bit #DSF-2-NF<br>(1) Flush Pin Gage to Check 1.3915 ± .005 dim.<br>(1) Flush Pin Gage to check .829 ± .003 dim.<br>(1) 3.998 ± .001 Snap Gage. Std.<br>(1) Flush pin gage to check 1.3915 ± .005 dim.<br>(1) Flush pin gage to check .829 ± .003 dim.<br>(1) 3.998 ± .001 snap gage. Std. | 72845-T-1<br>72845-T-2<br>72845-T-3<br>72845-T-4<br>72845-T-5<br>72845-T-6<br>Std.<br>72845-T-7<br>72845-T-8 |           |                | 3.60      | .06            | 13.89                    |     |
| 5        | 327<br>317<br>338<br>355 | Laboratory test<br>Inspection<br>Stock<br>Locate-from (3) Foundry pads on edge of flange and on (3) foundry pads on back side of flange.<br>Face end of casting to 1.3915 ± .005 from foundry pads on back side of flange.<br>Finish face joint face of bolt flange to .829 ± .003 dim. from end of casting.<br>Leave 1/32 rad. in corner.<br>Finish turn pilot to 3.998 ± .001 dia. Leave 1/32 radius in corner.<br>Break edges.<br>Final Inspection. | Laboratory Bench<br>Stock Room<br>12' x 5' Leblond 777 Engine Lathe. | 777       |                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                              |           |                |           |                |                          |     |
| 10       | 366                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Bench                                                                |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                              |           |                |           |                |                          |     |
| REMARKS: |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                      |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                              |           | TOTALS PER PG. |           | TOTALS PER JOB |                          |     |
|          |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                      |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                              |           | 93724          |           | C.E.M.         |                          | .06 |

Figure 14-1. A typical Standard route chart. (From L. E. Doyle, *Tool Engineering Analysis and Procedure*, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1950. Reprinted by permission.)

# INTER-RELATIONSHIP OF FACTORS FOR SUCCESSFUL MANUFACTURE



AMRINE AND OTHERS, MANUFACTURING ORGANIZATION AND MANAGEMENT, P. 3.

|                            |                                       |                        |                       |
|----------------------------|---------------------------------------|------------------------|-----------------------|
| <b>JOB NO.</b>             | <b>NAME AND NUMBER OF PART</b>        |                        | <b>W RATE</b>         |
| <b>OPERATION NO.</b>       | <b>OPERATION</b>                      | <b>MACHINE</b>         | <b>PCS. FINISHED</b>  |
| <b>OPERATOR'S NO.</b>      | <b>NAME</b>                           | <b>PCS. WANTED</b>     | <b>PCS. SCRAPPED</b>  |
| <b>REMARKS</b>             | <b>ELAPSED TIME</b>                   |                        |                       |
|                            | <b>STOPPED</b>                        | <b>STARTED</b>         |                       |
| <b>COST DEPT.</b>          | <b>PRODUCTION DEPT. ACCUMULATIONS</b> |                        |                       |
| <b>OPER, LABOR TO-DATE</b> | <b>TOTAL SCRAPPED</b>                 | <b>PIECES FINISHED</b> | <b>DIRECT HOURS</b>   |
| <b>P-08</b>                | <b>PIECE-WORK</b>                     | <b>DIRECT LABOR</b>    | <b>INDIRECT LABOR</b> |
| <b>PIECES</b>              | <b>P. W. AMT.</b>                     | <b>HRS.</b>            | <b>HRS.</b>           |
|                            | <b>AMT.</b>                           | <b>AMT.</b>            | <b>AMT.</b>           |

A typical job ticket. (Courtesy McCaskey Register Co.)

# PRODUCTION

DEVELOPING THE MOST ECONOMICAL METHODS AND PLANS FOR MANUFACTURING AUTHORIZED PRODUCTS; COORDINATING THE REQUIRED MANPOWER; SECURING AND COORDINATING MATERIALS, TOOLS, FACILITIES, AND UTILITIES; PRODUCING PRODUCTS: AND CONSIGNING THEM TO THE MARKETING ACTIVITY OR CUSTOMER.

## FUNCTIONS:

PLANT  
ENGINEERING:

SPECIFYING OR APPROVING, INSTALLING, MAINTAINING, AND OCCASIONALLY CONSTRUCTING THE BUILDINGS, UTILITY SERVICES, AND FACILITIES REQUIRED TO PRODUCE THE PRODUCTS.

INDUSTRIAL  
ENGINEERING:

PLANNING THE UTILIZATION OF MEN, FACILITIES, TOOLS, JIGS, AND FIXTURES TO ATTAIN THE DESIRED QUANTITY AND QUALITY OF OUTPUT AT MINIMUM COST.

PRODUCTION  
PLANNING &  
CONTROL:

PREPARING, ISSUING, AND ENCOURAGING COMPLIANCE WITH SCHEDULES OF THE MEN, MATERIALS, FACILITIES, INSTRUCTIONS, AND ALL ADDITIONAL ITEMS REQUIRED TO COMPLETE MANUFACTURING ORDERS SO THAT THEY WILL BE AVAILABLE WHEN AND WHERE REQUIRED.

MANUFACTURING:

MAKING PRODUCTS FOR SALE BY CHANGING THE SHAPE, COMPOSITION, OR COMBINATION OF MATERIALS, PARTS, OR SUB-ASSEMBLIES.

QUALITY  
CONTROL:

ESTABLISHING ACCEPTABLE LIMITS OF VARIATION IN THE ATTRIBUTES OF A PRODUCT AND REPORTING THE STATUS OF MAINTAINING THE PRODUCT IN RESPECT TO THOSE LIMITS.



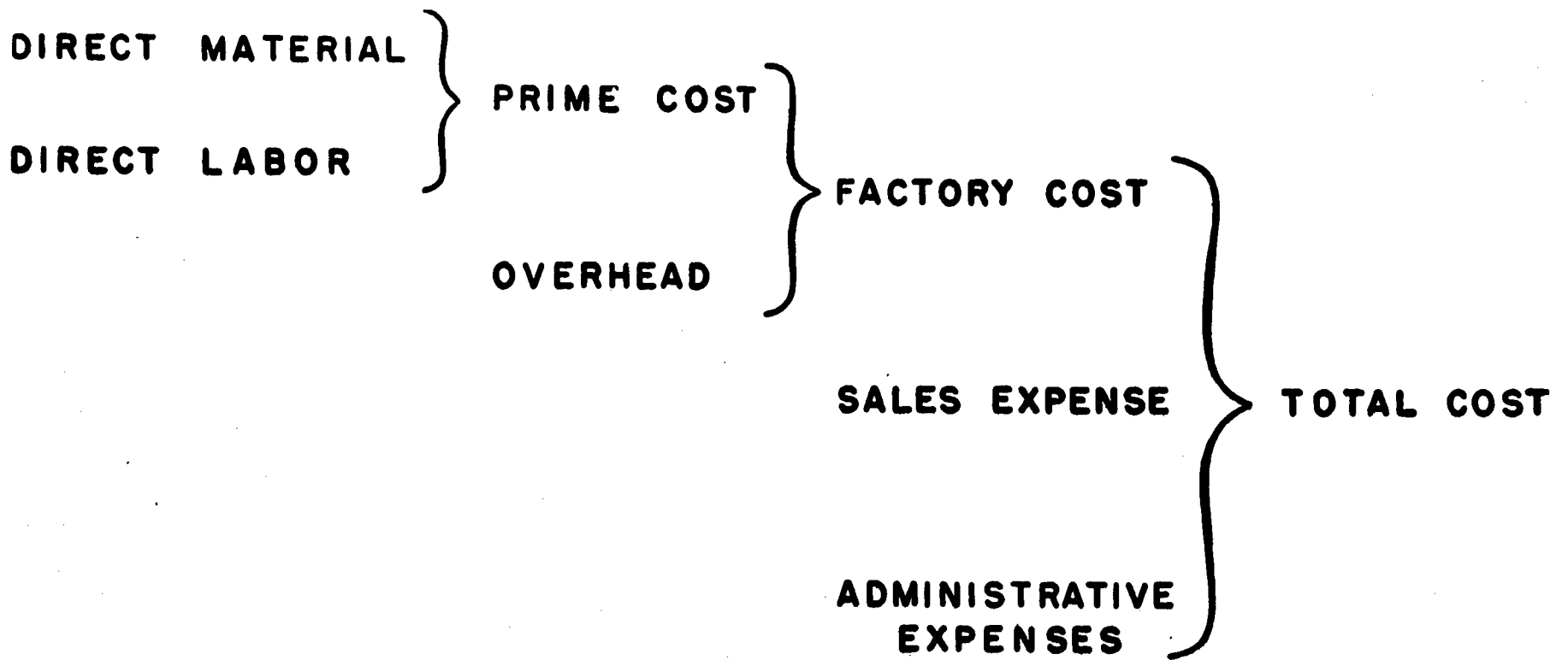
| VEHICLE DIVISION                 | COMPANY MANAGEMENT                                                                                                                                                                                          | PRODUCT ENGINEERING                                                                                                    | MANUFACTURING ENGINEERING                               | PRODUCTION CONTROL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PURCHASING                                                                                                                                                                                                                                                     |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(1) DESIGNS NEW PRODUCTS.</p> | <p>(2) APPROVES NEW PRODUCTS (PRODUCT PLANNING COMMITTEE).</p> <p>(3) ESTABLISHES PLANT PLANNING VOLUMES (FINANCE).</p> <p>(16) ESTABLISHES MONTHLY OFFICIAL PRODUCTION PROGRAM (SCHEDULING COMMITTEE).</p> | <p>(4) DESIGNS PARTS THROUGH RESEARCH AND EXPERIMENTS.</p> <p>(5) DEVELOPS SPECIFICATIONS FOR PARTS AND MATERIALS.</p> | <p>(6) DETERMINES SOURCE AND MANUFACTURING ROUTING.</p> | <p>(7) RECEIVES ENGINEERING INFORMATION.</p> <p>(8) ESTABLISHES EFFECTIVE POINTS FOR ENGINEERING CHANGES.</p> <p>(9) COORDINATES ENGINEERING CHANGES.</p> <p>(10) ISSUES PARTS PURCHASE REQUISITIONS FOR PARTS AND MATERIALS.</p> <p>(14) RECEIVES COPY OF PURCHASE ORDERS.</p> <p>(15) ESTABLISHES FLOATS.</p> <p>(17) RECEIVES MONTHLY OFFICIAL PRODUCTION PROGRAM, IF A VEHICLE DIVISION OR QUANTITATIVE SHIPPING INSTRUCTIONS IF A PARTS SUPPLIER.</p> <p>(18) SCHEDULES THE MANUFACTURING OF VEHICLES OR PARTS.</p> <p>(19) SCHEDULES PARTS AND MATERIALS FROM COMPANY AND OUTSIDE SUPPLIERS.</p> <p>(20) FOLLOWS FOR INCOMING SHIPMENTS.</p> <p>(21) RECEIVES INCOMING SHIPMENTS.</p> <p>(22) DELIVERS PARTS AND MATERIALS TO MANUFACTURING AREAS.</p> <p>(23) COORDINATES MANUFACTURING.</p> <p>(24) SHIPS FINISHED PRODUCT.</p> <p>(25) ISSUES NOTICES OF CANCELLATION.</p> <p>(28) DISPOSES OF OBSOLETE PARTS AND MATERIALS.</p> | <p>(11) RECEIVES PARTS PURCHASE REQUISITIONS.</p> <p>(12) NEGOTIATES CONTRACTS TO SUPPLY PARTS AND MATERIALS.</p> <p>(13) ISSUES PURCHASE ORDERS.</p> <p>(26) CANCELS PURCHASE ORDERS.</p> <p>(27) DETERMINES DISPOSITION OF OBSOLETE PARTS AND MATERIALS.</p> |

REVISED AUGUST 20, 1950

*Courtesy Ford Motor Co.*

## HOW PRODUCTION CONTROL IN THE FORD MOTOR COMPANY RELATES TO OTHER ACTIVITIES.

# DEVELOPMENT OF THE TOTAL COST OF A PRODUCT



DIRECT MATERIAL  
↓  
MATERIALS THAT GO DIRECTLY  
INTO THE PRODUCT.  
(SCRAP OR WASTE IS INCLUDED)

OVERHEAD  
↓  
HEAT  
SANDPAPER  
PAINT  
RENT  
MAINTENANCE WORK  
TELEPHONE  
TAXES  
INSURANCE  
LIGHTS

SALES EXPENSES  
↓  
SALARIES & COMMISSIONS  
OF SALESMEN  
TRAVEL EXPENSES  
ADVERTISING

ADMINISTRATIVE EXPENSES  
↓  
SALARIES OF EXECUTIVES  
SECRETARIAL SALARIES  
LEGAL FEES

Revised from Amrine, Ritchey, and Hulley, Manufacturing Organization and Management, p. 322.

Name: \_\_\_\_\_

Section: \_\_\_\_\_

INDUSTRIAL ARTS PRODUCT EVALUATION SHEET

Directions: Read the description of each grading area listed below and then grade your product in the section marked student at the bottom of the page. Circle the number you feel you deserve for each grading area. The instructor will then grade the product in the area marked instructor. Add the total number of points and determine your grade from the chart at the bottom.

1. Design: Is the product well designed, does it do the job it was intended to do, was the design your idea?
2. Planning and Sketching: Were the plans and sketches done well enough to construct the product accurately, were they complete and neat?
3. Difficulty: Is the product hard to make (5 points), of medium difficulty (3 points), or easy to make (2 points).
4. Use of Hand and Machine Tools: Were hand and machine tools used properly and safely?
5. Use of Materials: Were materials used in the best possible way with the least possible waste?
6. Construction: Is the product constructed as well as it should be and as well as you can construct it?
7. Appearance: Does the product look good, is it something that you can be proud of, would you buy one like it?
8. Accuracy: Is the product constructed according to plans that were approved?
9. Finish: Is the finish applied properly and evenly, is it smooth and free from marks and scratches?
10. Use of Time: Did you make the best use of your time in the manufacture of your product, did you waste time?
11. Work on your own: Are you able to work on your product with only limited help from the instructor?
12. Attitude: Are you a hard worker, do you do your work well, do you help others, do you clean up well each day?

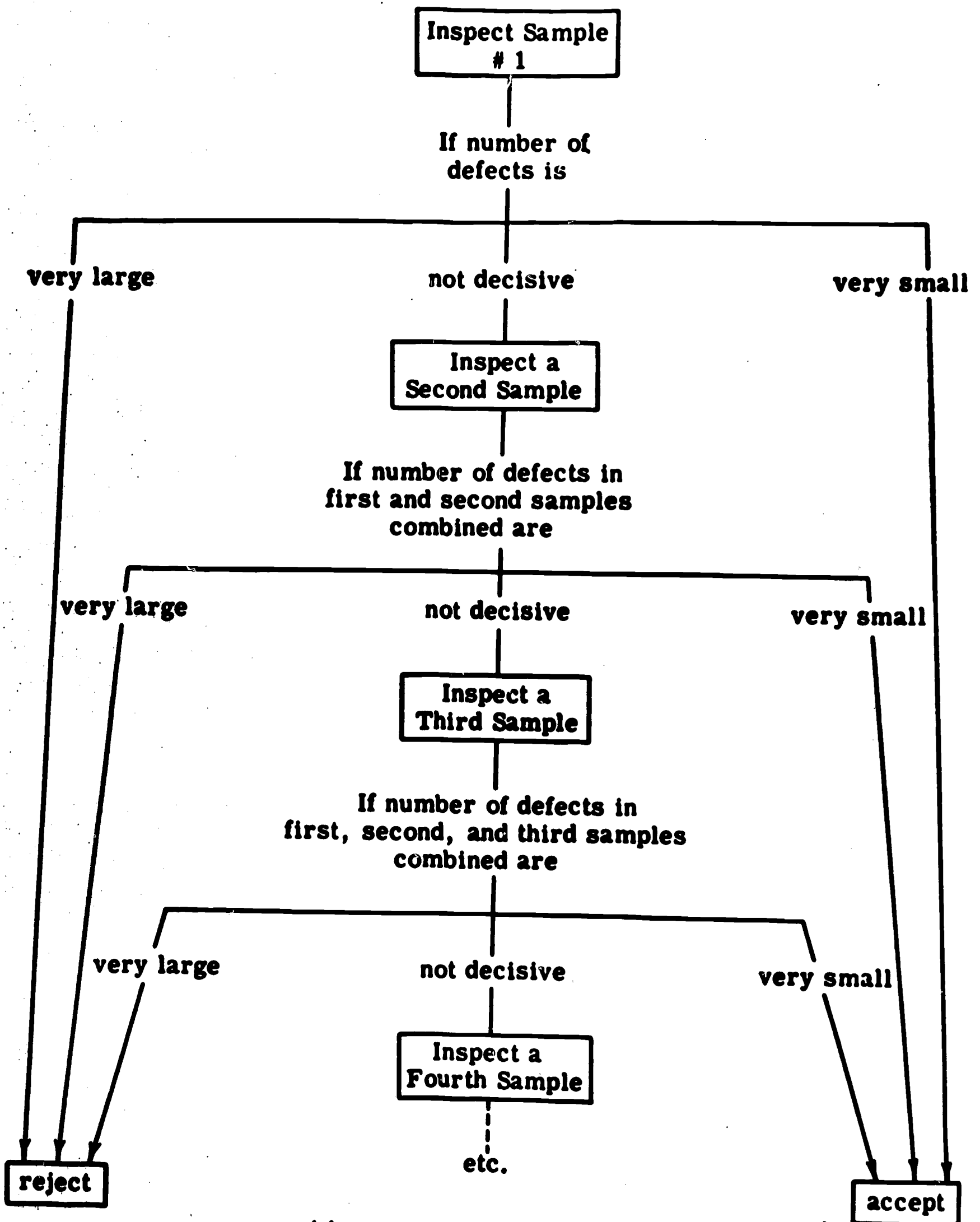
| Student Use Only |           |      |         |               |      | Instr. Use Only |           |      |         |               |      |
|------------------|-----------|------|---------|---------------|------|-----------------|-----------|------|---------|---------------|------|
|                  | Excellent | Good | Average | Below Average | Poor |                 | Excellent | Good | Average | Below Average | Poor |
| 1. Design        | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 2. Planning      | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 3. Difficulty    | 5         |      | 3       | 2             |      |                 | 5         |      | 3       | 2             |      |
| 4. Use of Tools  | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 5. Materials     | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 6. Construction  | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 7. Appearance    | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 8. Accuracy      | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 9. Finish        | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 10. Use of Time  | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 11. Own Work     | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| 12. Attitude     | 5         | 4    | 3       | 2             | 1    |                 | 5         | 4    | 3       | 2             | 1    |
| Total Points:    |           |      |         |               |      | Total Points:   |           |      |         |               |      |

Grade: \_\_\_\_\_

Grade: \_\_\_\_\_

- 0-17 Poor (F)
- 18-29 Below Average (D)
- 30-41 Average (C)
- 42-53 Good (B)
- 54-60 Excellent (A)

# CONTROL PROCEDURES



*Adapted from J. M. Juran, ed., Quality Control Handbook, (New York: McGraw-Hill Book Co., Inc., 1951), p. 432.*

**EMPLOYEE APPRAISAL**

Employee's Name \_\_\_\_\_ Classification \_\_\_\_\_  
 Bank \_\_\_\_\_ Department \_\_\_\_\_ Division \_\_\_\_\_  
 Rating Supervisor \_\_\_\_\_ Section \_\_\_\_\_

This form is designed to help you appraise accurately the value of employees to the organization. You are asked to rate the employee on each of the several traits or qualities listed here. After each trait there is a line representing various degrees of the trait. The descriptive phrases beneath the line indicate the amounts or degrees of the trait represented by five points along the line. They are guide-posts. You rate the employee by checking at any place along the line that represents your judgement of him.

In view of the importance of these ratings, you are asked to study and observe the rules printed on the other side of the sheet.

**QUALITY OF WORK**

Doubtful that quality is satisfactory.

While not unsatisfactory, quality is not quite up to standard.

Quality is quite satisfactory.

Quality of work is superior to that of general run of employees.

Exceptionally high quality.

No chance to observe. \_\_\_\_\_

**VOLUME OF WORK**

Unusually high output.

Turns out more work than general run of comparable employees.

Average, satisfactory output.

Inclined to be slow.

Insufficient output.

No chance to observe. \_\_\_\_\_

**CAPACITY TO DEVELOP**

Future growth doubtful.

Moderate development ahead.

Shows promise.

Very promising promotional material.

Great future growth probable; should go far

No chance to observe. \_\_\_\_\_

Portion of a simple personnel rating scale using descriptive phrases. (From W. G. Ireson and E. L. Grant, *Handbook of Industrial Engineering and Management*, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1955. Reprinted by permission.)

FRASER & JONES CO.  
1290-S

Foreman's and Superintendent's Copy

# GRIEVANCE FORM

Classification

Number

Department \_\_\_\_\_

Date of Request \_\_\_\_\_

Nature of Grievance:

Occupation \_\_\_\_\_

Signed \_\_\_\_\_

Payroll No. \_\_\_\_\_

FOREMAN'S DISPOSITION:

Granted \_\_\_\_\_ Rejected \_\_\_\_\_ Compromised \_\_\_\_\_ Referred to Superior \_\_\_\_\_

Date \_\_\_\_\_ 19 \_\_\_\_\_

Signed \_\_\_\_\_ Foreman

PLANT SUPERINTENDENT'S DISPOSITION: (2nd Step)

Granted \_\_\_\_\_ Withdrawn \_\_\_\_\_

Rejected \_\_\_\_\_ Compromised \_\_\_\_\_

Remarks:

Date of Disposition \_\_\_\_\_

Plant Superintendent

MANAGER'S DISPOSITION (3rd Step)

Granted \_\_\_\_\_ Rejected \_\_\_\_\_ Withdrawn \_\_\_\_\_ Compromised \_\_\_\_\_ Pending \_\_\_\_\_

Remarks:

Date of Disposition \_\_\_\_\_

Manager or Asst. Manager

For more space  
use other side

## MARKETING FUNCTIONS

DEFINITION: DIRECTING AND ENCOURAGING THE FLOW OF GOODS FROM PRODUCER TO CONSUMER OR USER.

MARKETING RESEARCH: GATHERING, RECORDING, AND ANALYZING FACTS RELATING TO THE TRANSFER AND SALE OF PRODUCTS.

ADVERTISING: THE NON-PERSONAL PRESENTATION AND PROMOTION OF IDEAS, PRODUCTS, OR SERVICES PAID FOR BY A SPONSOR.

SALES PROMOTION: SUPPLEMENTING AND CO-ORDINATING PERSONAL SELLING AND ADVERTISING FOR GREATER EFFECTIVENESS.

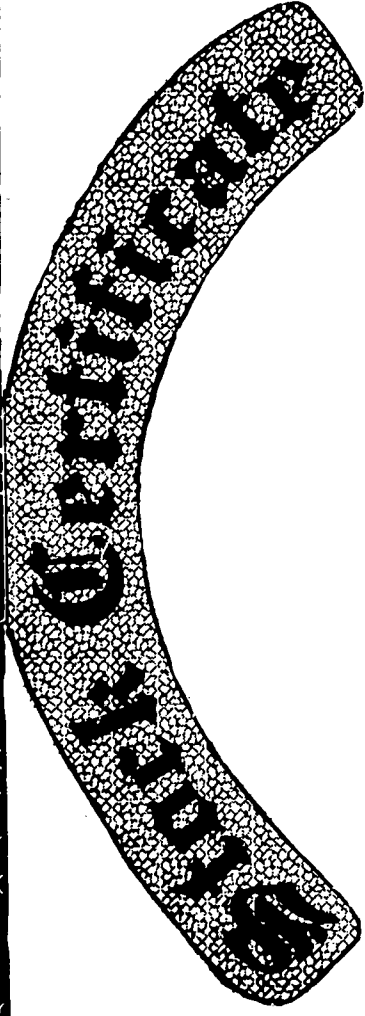
SALES PLANNING: PLANNING FOR MARKETING THE RIGHT PRODUCTS AT THE RIGHT PLACE, AT THE RIGHT TIME, IN THE RIGHT QUANTITIES, AND AT THE RIGHT PRICE.

SALES OPERATIONS: TRANSFERRING PRODUCTS TO CUSTOMERS IN EXCHANGE FOR MONEY.

PHYSICAL DISTRIBUTION: MOVING AND HANDLING PRODUCTS FROM THE POINT OF STORAGE TO THE POINT OF CONSUMPTION OR USE.

BETHEL, AND OTHERS, INDUSTRIAL ORGANIZATION AND MANAGEMENT, P. 534.

NON-LEGAL  
ONE SHARE  
**\$1.00**  
PAR VALUE



NON-TRANSFERABLE  
CERTIFICATE NUMBER

No 0125

DATE \_\_\_\_\_

*This Certifies That*

\_\_\_\_\_ IS THE OWNER OF  
first name initial last name number street  
city state or province zip code

ONE SHARE, PAR VALUE ONE DOLLAR, OF THE CAPITAL STOCK OF

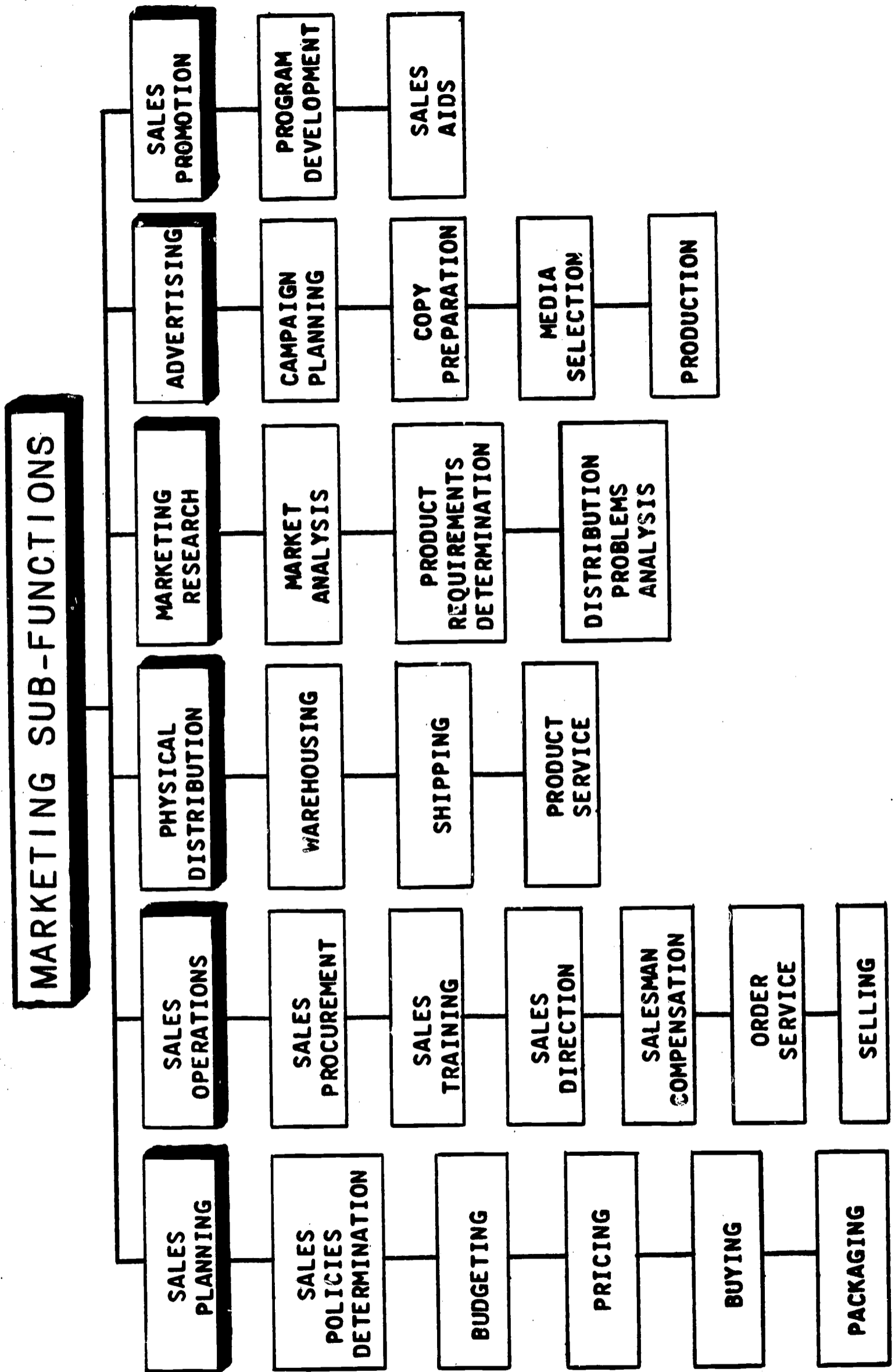
**SCHOOL PRODUCTS, INC.**

\_\_\_\_\_ SUBJECT TO INFORMATION ON THIS CERTIFICATE.  
city state or province

\_\_\_\_\_ stockholder  
company representative

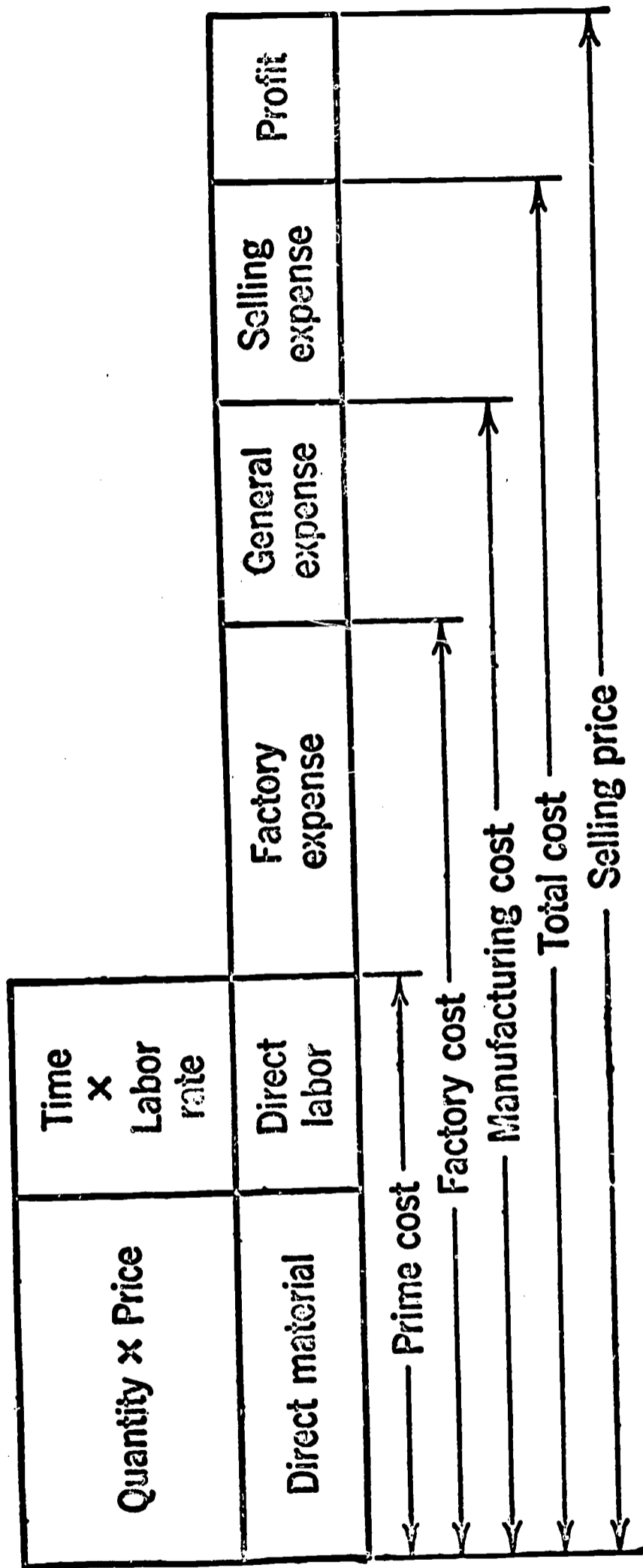
STOCKHOLDER VOTES FOR ELECTION OF BOARD OF DIRECTORS





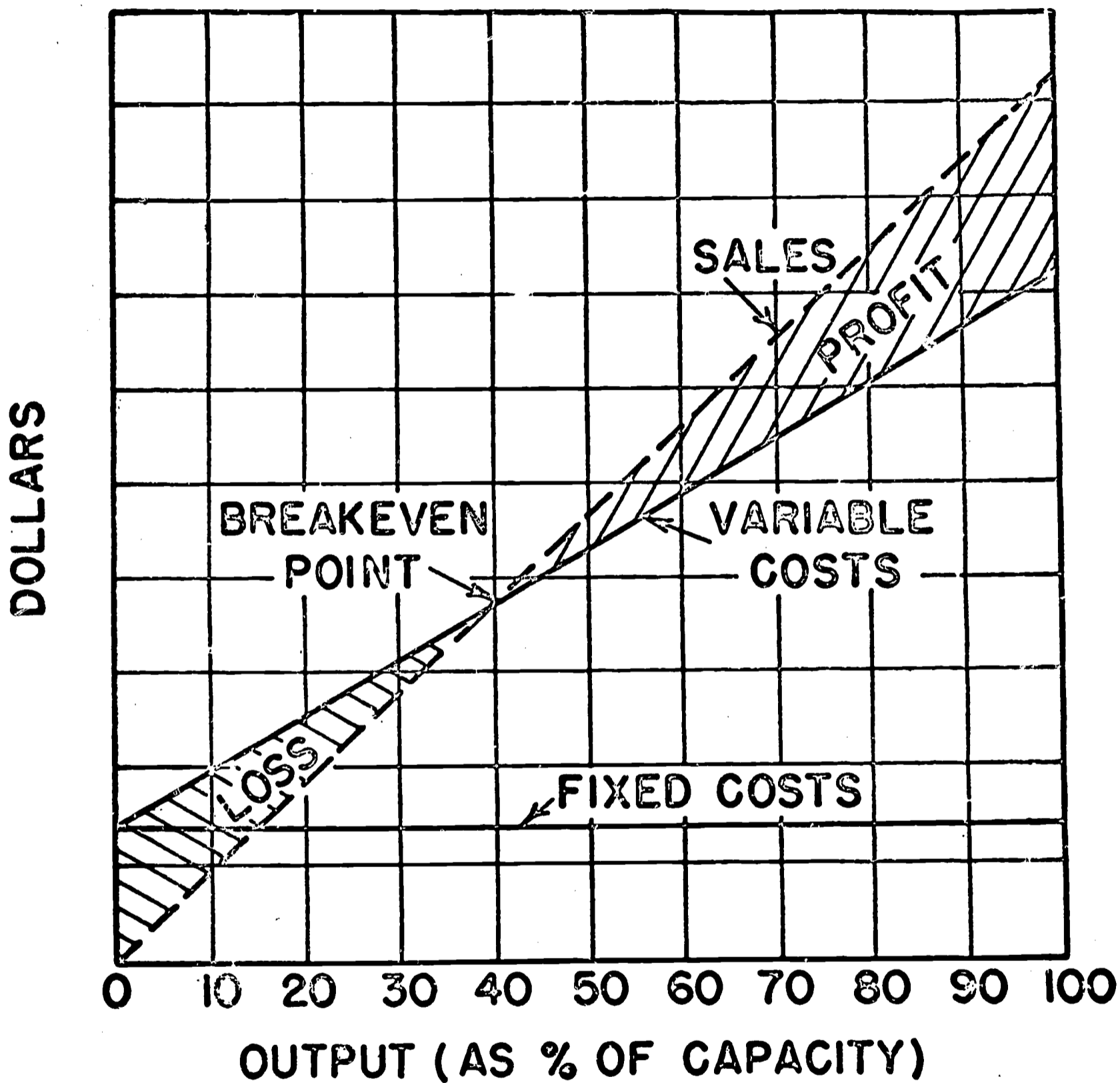
ACME, COMMON BODY OF KNOWLEDGE, CHART IV.

# THE GENERAL COMPONENTS OF COST



STRONG, THE MANAGEMENT OF BUSINESS, P. 143.

# RELATION OF COSTS TO PROFIT



WHEELER, BUSINESS: AN INTRODUCTORY ANALYSIS, P. 247.

# TOTAL COST & SELLING PRICE OF A PRODUCT

Direct material

Direct labor

Prime cost

(Total of above two)

Overhead

Factory cost

(Total of overhead  
& prime cost)

Sales expense

Administrative  
expenses

TOTAL COST

(Total of factory cost, sales,  
& administrative expenses)

Profit

SELLING PRICE

(Total cost + Profit)

# FUNCTIONS OF FINANCIAL CONTROL

PLANNING, DIRECTING, AND MEASURING THE RESULTS OF COMPANY MONETARY OPERATIONS.

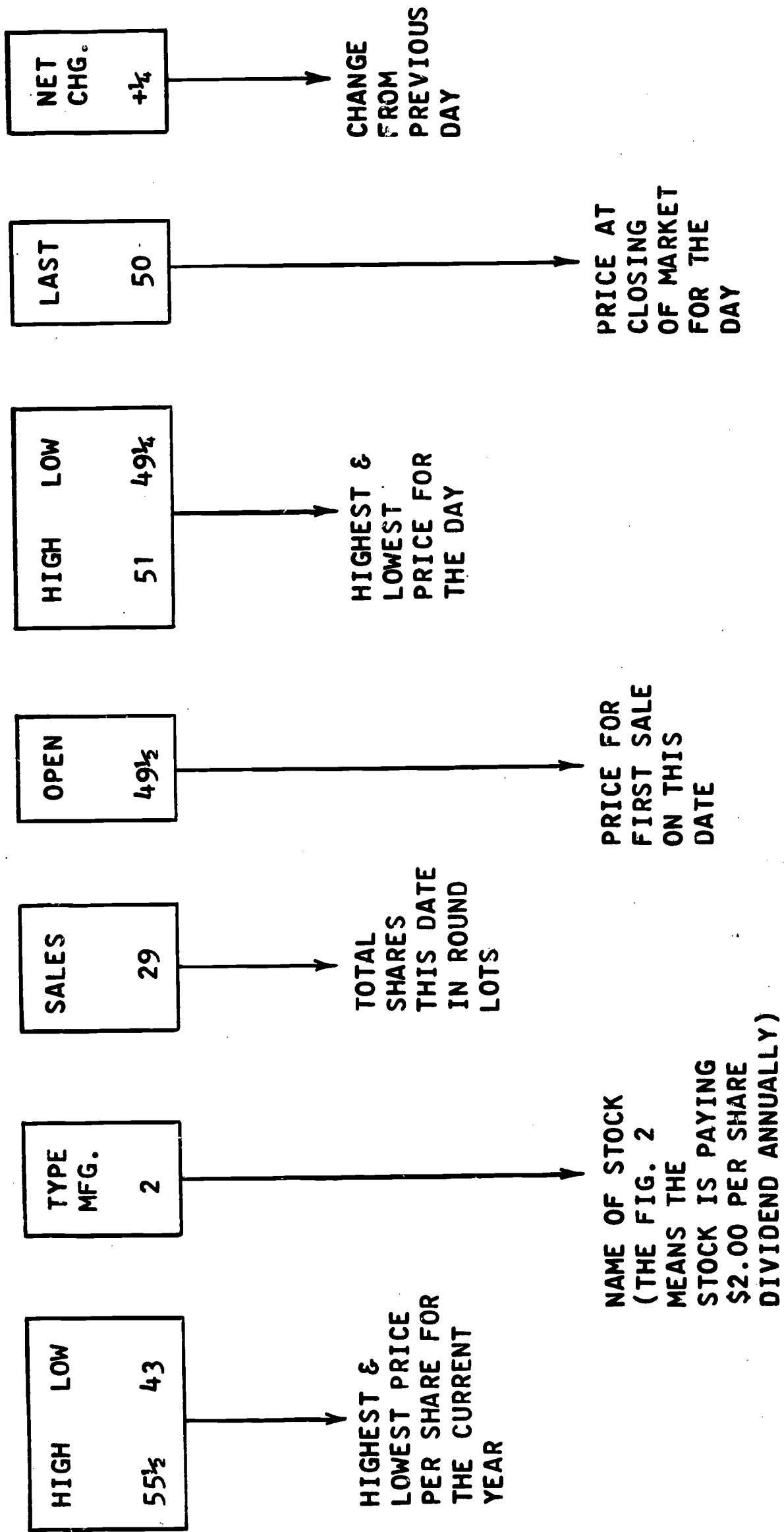
FINANCE: SECURING ADEQUATE OPERATING FUNDS AT MINIMUM COST; INVESTING SURPLUS FUNDS AT BEST ADVANTAGE; AND MAINTAINING A GOOD PECUNIARY REPUTATION FOR THE COMPANY.

CONTROL: MAINTAINING RECORDS AND PREPARING REPORTS TO (1) MEET CORPORATE, LEGAL AND TAX REQUIREMENTS AND (2) MEASURE THE RESULTS OF THE COMPANY OPERATIONS; AND PROVIDING ACCOUNTING SERVICES STRUCTURED FOR USE BY MANAGERS IN PLANNING AND CONTROLLING THE BUSINESS.

PURCHASING: SECURING WHEN REQUIRED AND AT MINIMUM COST THE QUANTITY AND QUALITY OF MATERIALS, SUPPLIES, SERVICES, AND EQUIPMENT NEEDED TO OPERATE THE COMPANY.

ACME, COMMON BODY OF KNOWLEDGE, CHART V.

HOW TO READ THE FINANCIAL PAGE OF YOUR NEWSPAPER



MUSSELMAN & HUGHES, INTRODUCTION TO MODERN BUSINESS, P. 333.

**TOOLS AND EQUIPMENT:**

The tools and equipment necessary for this unit will be those common to the laboratory of industries, including overhead projector, 16 mm. projector and screen.

**MATERIALS AND SUPPLIES:**

No special materials or supplies are needed in this unit. Those commonly found in the laboratory of industries are all that are required.

**LESSONS TO BE TAUGHT:**

Local Household Accessories Industries and their Effect on  
Employment and the Economy

Procedure in Selecting a Product

Principles of Good Design

Making Working Drawings and/or Sketches of Selected Product

Selection of Materials for Individual Products

Production Plan and/or Construction Details

Types of Ownership

Industrial Organization and Laboratory Personnel System

Simple Layout Tools and Procedures

Simple Cutting Tools and Procedures

Simple Forming Tools and Procedures

Simple Assembly Tools and Procedures

Simple Holding Tools and Procedures

Finishing, Methods and Materials

Quality Control Procedures and Inspection

Marketing Procedures



Title: Local Household Accessories Industries and their Effect  
on Employment and the Economy

Presentation:

I. Define household accessories industries

- A. An industry which produces articles for the home which make life more comfortable and convenient but which are not absolutely necessary

II. Effect on employment

A. Local

- 1. Varies with location

B. National

- 1. Hundreds of thousands of people employed

III. Local industries

A. Names of

- 1. Varies with location

B. Why located in area

- 1. Raw materials
- 2. Labor supply
- 3. Good market
- 4. Type of skill required

IV. Effects on economy

A. Breakdown of consumer dollar

- 1. Taxes
- 2. Food
- 3. Clothing
- 4. Savings
- 5. Housing
- 6. Others
  - a. Accessory items

B. Breakdown of industrial dollar

- 1. Materials
- 2. Labor
- 3. Overhead
- 4. Profits

V. Production controls

A. Analysis of product

1. Time
2. Plant facilities
3. Materials
4. Skills

References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley,  
Manufacturing Organization and Management, pp. 468-489.

Title: Procedure in Selecting a Product

Presentation:

I. Selection of product in industry

A. Engineering

1. Need for the product
2. Limitations
  - a. Labor
  - b. Management
  - c. Materials
  - d. Equipment
  - e. Market
  - f. Cost
3. Selection of product
  - a. List available possibilities
  - b. Evaluate in terms of limitations
  - c. Select product

II. Selection of product in laboratory of industries

A. Engineering

1. Must have need
2. Must be household accessory

B. Limitations

1. Time
2. Ease of construction
  - a. Simple machinery
  - b. Inexperienced students
3. Adaptable to school situation
  - a. Short class periods
  - b. Limited equipment
  - c. Limited materials
4. Construction from sheet materials
  - a. Examples of available sheet material

C. Selection of the product

1. List many possibilities
2. Eliminate those not meeting limitations
3. Select a product

References:

Harold Amrine and others, Manufacturing Organization and Management, pp. 442-444.

John Feirer and John Lindbeck, Industrial Arts Metalwork, p. 10.

John Feirer, Woodworking for Industry, p. 47.

Title: Principles of Good Design

Presentation:

- I. Selection of product to be designed
  - A. List examples of household accessories on board
  - B. Select bookrack as possible example
- II. Functions of design pertaining to bookrack
  - A. Strength
    1. Strong enough to hold books
    2. Materials not too heavy to appear awkward
  - B. Durability
    1. Joints strong enough
    2. Finish of lasting quality
  - C. Suitable materials
    1. Suitable to fulfill requirements
      - a. Sheet material
    2. Material suitable to match household surroundings
    3. Material suitable to construct bookrack
  - D. Attractive
    1. In materials
    2. In construction
    3. In finish
    4. In shape
  - E. Suitable size
    1. Adequate for number of books desired
    2. Adequate for size of books desired
    3. Suitable for place of intended use

References:

John Feirer, Woodworking for Industry, pp. 32-42, 48, 433.

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 12, 210.

Title: Making Working Drawings and/or Sketches of Selected Products

Presentation:

- I. Selection of product to be drawn
  - A. List examples of household accessories on board
  - B. Select bookrack as possible example
- II. Sketching procedure
  - A. Determine necessary views
    1. Front
    2. End
  - B. Front view
    1. Distribute paper
    2. Use lower left portion of paper
      - a. Draw base
      - b. Add end pieces onto base
        - 1) Show pieces of bookrack as example
        - 2) Draw only in proportion
          - a) Not to correct size
          - b) Use correct relationship of sizes
  - C. Side view
    1. Use lower right portion of paper
    2. Extend lines from front view to right
      - a. Draw base
      - b. Add side piece onto base
- III. Dimensioning
  - A. Determine necessary sizes
    1. Size of books
    2. Number of books
      - a. Length of base
      - b. Width of base
      - c. Width of side
      - d. Height of side
      - e. Distance between ends
- IV. Proceed in similar manner with selected product

Title: Selection of Materials Necessary for Individual Products

Presentation:

I. Product materials

A. Definition

1. Any thing that goes into the making of a product except for the time necessary to make it

B. Our company is limited to sheet materials

1. Sheet metals - both ferrous and nonferrous
2. Plywood
3. Hardboard
4. Particle board
5. Sheet plastics
6. Leather

II. Cost analysis and process chart

A. Use and purpose of the chart

1. Material needed section
  - a. Necessary to get materials
  - b. Need total cost to establish selling price
2. Production and tool routing section
  - a. Necessary to organize work
  - b. Need total time to complete the product in order to establish the selling price
3. Relation to cooking a pizza
  - a. Must know if the ingredients are available
  - b. Must know cost of ingredients if they are to be purchased
  - c. Need recipe to know the correct order to do the necessary steps

Reference:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley,  
Manufacturing Organization and Management, pp. 161-162,  
258-270.



Title: Production Plan and/or Construction Details

Presentation:

I. Relate planning to the students

A. What are you going to wear?

B. What are you going to do?

II. Relate planning to method engineering in industry

A. Production and tool routing forms

1. Material
2. Part name
3. All operations listed
4. Names of all machines listed
5. Names of all tools listed
6. Length of time noted

B. Flow process chart

1. All methods listed
2. Chart for only one part
3. What flow chart symbols mean

C. Cost analysis and process chart

1. Use and purpose of the form
  - a. Production and routing
    - 1) Need planning
    - 2) Need work times for determining selling price

References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley,  
Manufacturing Organization and Management, pp. 116-120,  
258-270.

Title: Types of Ownership

Presentation:

I. Ownership types

A. Different types of ownership

1. Individually-owned
2. Partnership
3. Cooperative
4. Corporation

B. Our company

1. Partnership

a. How it is formed

- 1) Two or more people combine resources to carry on a legal business as co-owners

b. Why it is formed

- 1) To give more capital for the business

c. Advantages

- 1) More capital to work with
- 2) Often to get someone with more knowledge of a specific function of business or manufacturing

d. Disadvantages

- 1) Owner's liability is all of the property of all owners

Reference:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley,  
Manufacturing Organization and Management, pp. 449-462.

Title: Industrial Organization and Laboratory Personnel

Presentation:

I. How industry organizes to take care of clean-up work

A. Suggestions from class

B. How these would work in school laboratories

II. Personnel system

A. Organization of personnel system

1. Board of directors
  - a. Who they are
  - b. What they do
2. Shop superintendent
  - a. Show transparency of entire personnel system
  - b. Describe duties of shop superintendent
  - c. Nominate and elect shop superintendent
3. Shop foreman
  - a. Show transparency of personnel system
  - b. Describe duties of shop foreman
  - c. Volunteer for position
4. Tool foreman
  - a. Show transparency of personnel system
  - b. Describe duties of tool foreman
  - c. Volunteer for position
5. Safety engineer
  - a. Show transparency of entire personnel system
  - b. Describe duties of shop superintendent
  - c. Volunteer for position
6. Area supervisors
  - a. Show laboratory division into four areas
  - b. Show transparency of personnel system
  - c. Describe duties of area supervisors
  - d. Volunteers for positions
7. Machinery workers
  - a. Show transparency of entire personnel system
  - b. Describe duties of machinery workers
  - c. Volunteers for positions
8. Bench workers
  - a. Show transparency of personnel system
  - b. Describe duties of bench workers
  - c. Volunteers for positions
9. Assistants
  - a. Show transparency of personnel system
  - b. Describe duties of assistants
  - c. Volunteers for assistants

10. Waste supervisor
  - a. Show transparency of entire personnel system
  - b. Describe duties of waste supervisor
  - c. Volunteer for position
11. Safety equipment supervisor
  - a. Show transparency of entire personnel system
  - b. Describe duties of safety equipment system
  - c. Volunteer for position

References:

Harold Amrine, John Ritchey, and Oliver Hulley, Manufacturing Organization and Management, p. 339.

Claude George, Jr., Management in Industry, pp. 16-23.

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 225-227.

Observation of various personnel systems used in different schools and colleges.

## PERSONNEL ORGANIZATION

Below are listed the duties to be performed by the various personnel officers and their helpers. These should be studied carefully by all members of the class and an effort to fulfill them should be made by those appointed or elected to office and those assigned as helpers.

### Shop Superintendent:

1. Help the instructor in every way possible.
2. Coordinate the work of the various foremen.
3. Help the instructor in clean-up inspection.
4. Assist in training the workers on their jobs.
5. Assist any other foreman needing help.

### Foreman:

#### Shop Foreman

1. Supervise the various clean-up jobs, inspect them when completed.
2. Make clean-up assignments as directed by the superintendent.
3. Maintains the shop in a neat, clean and orderly manner.
4. Assists in training helpers in their jobs.

#### Tool Foreman

1. Checks tools for loose handles, broken parts, etc.
2. Checks all tool panels at the beginning and end of each period to be sure all tools are in proper places.

#### Safety Engineer

1. Checks machines to see that guards and other vital parts are in good working order.
2. Report all safety rule violations to instructor.
3. Checks lighting and ventilation when necessary.
4. Assists other men in his department when necessary.

## PERSONNEL ORGANIZATION (Continued)

### Area Supervisors:

1. Sweep areas thoroughly after benches and machines have been cleaned.
2. Pick up all usable scrap, abrasive, screws, nuts, bolts, etc., and place in their proper containers.
3. Supervise the other workers in your area.
4. Report to the shop foreman.

### Benches:

1. Return any tools to proper place on panels.
2. Clean tops of benches and vises in your area.
3. Clean and arrange equipment on shelves under benches.
4. Report to area supervisors.

### Machinery and Equipment:

1. Clean and dust all machinery and equipment in your area.
2. Check and maintain accessories.
3. Report to area supervisor.

### Assistants:

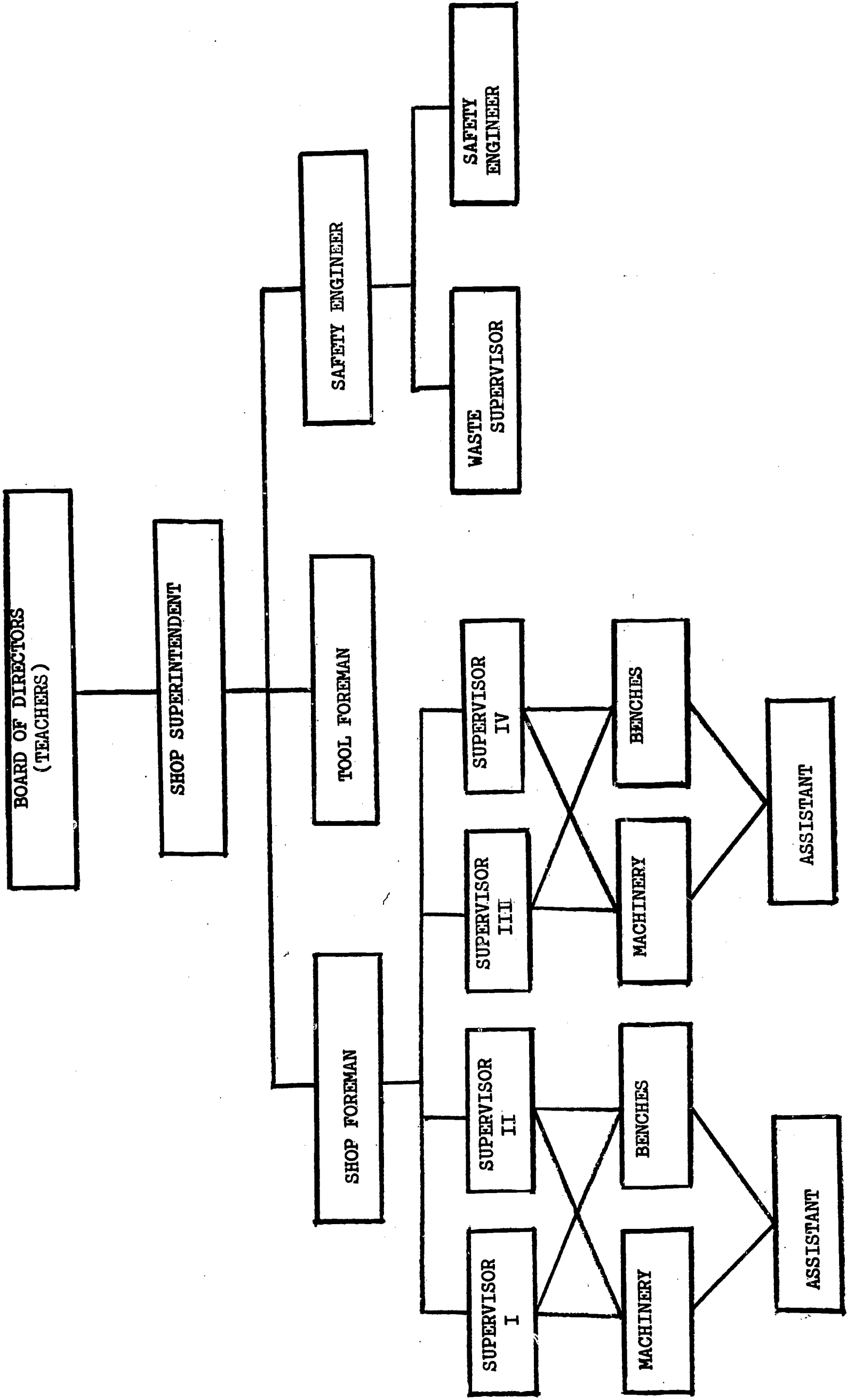
1. Take the place of absentees as directed by shop foreman.
2. Assist others when and if necessary.
3. Maintain sink and finish area.
4. Report to area supervisors.

### Safety Equipment Supervisor:

1. Pass out aprons at beginning of period.
2. Collect and put away aprons at end of period.
3. Check safety shields to be sure they are at proper machines and in good order.
4. Report to Safety Engineer.

### Waste Materials Supervisor:

1. See that all scrap or waste materials are disposed of.
2. Properly dispose of oily materials and finishing materials.
3. After floors are swept, place all scrap materials in waste receptacles.
4. Report to Safety Engineer.



Title: Simple Layout Tools and Procedures

Presentation:

I. Definition

A. Measuring and marking on material

II. Layout tools

A. Squares

1. Uses

- a. Make a mark square with an edge
- b. Laying out angles

2. Similarity of all squares

B. Bench rules

1. Uses

- a. Measuring
- b. Making straight lines

2. Circumference rule

- a. For calculating circumference of a cylinder

C. Compass

1. Uses

- a. Circles
- b. Arcs

2. Similarity to dividers

- a. Transfer

D. Marking instruments

1. Pencil

2. Scratch awl

3. Scriber

III. Laying out on any material

A. Similar process on any material

B. Need for accuracy

C. Surface protection

References:

Chris H. Groneman and John L. Feirer, General Shop,  
pp. 79-82, 169-173, 350-351.



Title: Simple Cutting Tools and Procedures

Presentation:

I. Definition

A. Separation of materials by wedge-shaped tools

II. Types

A. Drilling tools

1. The action of a single wedge in a rotary motion

2. Kinds

a. Auger

- 1) Wood
- 2)  $\frac{1}{4}$ " to 1" diameter

b. Automatic hand drill

- 1) Wood
- 2)  $\frac{1}{16}$ " to  $\frac{1}{4}$ " diameter

c. Portable electric drill

- 1) Any material
- 2)  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ " chuck capacities

B. Sawing tools

1. A series of wedges on a solid back

2. Kinds

a. Coping saw

- 1) Curved cutting
- 2) Sheet materials except for ferrous metals

b. Crosscut saw

- 1) Straight cut across the grain
- 2) Wood

c. Hack saw

- 1) Straight cutting
- 2) Metals and other materials

d. Scroll saw

- 1) Curved and straight cutting
- 2) Any material

C. Shearing tools

1. Two planes working against each other

2. Kinds

a. Wood chisel

- 1) Stock removal
- 2) Wood, soft materials

b. File

- 1) Smoothing and stock removal
- 2) Any material

c. Tin snips

- 1) Straight and curved cutting
- 2) Thin sheet material

- d. Block plane
  - 1) Stock removal
  - 2) Wood, soft materials

References:

Chris H. Groneman and John L. Feirer, General Shop, pp. 178, 180, 83, 353, 192.

Title: Simple Forming Tools

Presentation:

I. Define forming tool

- A. A tool used to change the shape of material by bending

II. Kinds

A. Round nose pliers

- 1. Rolling wire into small circles

B. Mallet

- 1. Pounding material to shape without leaving hammer marks

C. Ball peen hammer

- 1. Shapes metal by making many small dents close together

D. Hand seamer

E. Stakes

- 1. Different kinds
- 2. Serves as mold for bending metal

F. Bending brake

- 1. Makes straight bends of various angles

G. Slip roll former

- 1. Shapes flat sheet metal into cylindrical shapes

References:

Chris H. Groneman and John L. Feirer, General Shop,  
pp. 194-198-200.

Title: Simple Assembly Tools

Presentation:

I. Define assembly tools

- A. Tools used in the process of fastening individual parts together

II. Kinds

A. Claw hammer

- 1. Driving nails
- 2. Pulling nails

B. Nail set

- 1. Sinking heads of nails below the surface of the wood

C. Screwdriver

- 1. Regular
  - a. Used on regular single slot screws
- 2. Phillips
  - a. For cross slot screws
  - b. Better gripping

References:

Chris H. Groneman and John L. Feirer, General Shop, pp. 112-113

Title: Simple Holding Tools

Presentation:

I. Define holding tool

- A. Any tool used either to clamp parts temporarily to make an operation easier or to hold another tool

II. Kinds

A. Pliers

- 1. Holds small parts to protect fingers and make handling easier

B. Bit brace

- 1. Used to hold bits

C. Vise

- 1. Wood
  - a. For woods or plastics
- 2. Machinist
  - a. For metals

D. Bench plate

- 1. For holding metal forming stakes

E. Hand clamps

- 1. For quick jobs
- 2. Variety of sizes

F. C-clamp

- 1. Variety of sizes

G. Adjustable hand screw

References:

Chris H. Groneman and John L. Feirer, General Shop, p. 121.

Title: Finishing Materials and Methods  
(Overview)

Presentation:

I. Abrasives

A. Definition

1. Coated papers or cloth or pumice stone used for cutting down finish surfaces

B. Common

1. Sandpaper
2. Garnet
3. Steel wool
4. Aluminum oxide

II. Fillers

A. Definition

1. A base preparation composed of silex, colors ground in oil and a grinding liquid or binder used to fill wood pores level preparatory to finishing

B. Hole and crack

C. Grain or pore filler

D. How to apply each

III. Stains

A. Definition

1. Classified as to spirit, oil or water-soluble dyestuff; term should not be used in connection with pigments which produce modified paints only

B. Oil

C. Water

D. Spirit

E. How to apply each

#### IV. Finishes

##### A. Definition

1. Material used to coat or cover surfaces to preserve or enhance the beauty of a material

##### B. Shellac

##### C. Varnish

##### D. Paint

1. Oil
2. Water

##### E. Enamel

##### F. Common rubbed finishes

1. Wax
2. Oil

#### V. Techniques

##### A. Definition

1. Method used in applying a finish

##### B. Brushing

##### C. Spraying

##### D. Rubbing

#### References:

John L. Feirer, Advanced Woodwork and Furniture Making, pp. 138-153.

Verne C. Fryklund, General Shop Woodworking.

S. W. Gibia, Wood Finishing and Refinishing.

Chris Groneman, General Woodworking, pp. 147-163.

Herman Hjorth, Basic Woodworking Processes, pp. 171-189.

Ira C. Madden, Woodworking for Industrial Arts, pp. 108-125.

Clifton Newell and William Holtrop, Coloring and Painting Wood.

Willis Wagner, Woodworking, pp. 51-63.

Ralph Waring, Modern Wood Finishing.

Title: Quality Control Procedures and Inspection

Presentation:

I. How many have heard the term "quality control?"

II. What is "quality control?"

A. Assures the end product conforms with standards

1. Who sets standards in quality control?

- a. Industry
  - 1) Buyers of materials
  - 2) Sellers of the product
  - 3) Workers
  - 4) Management
  - 5) Customers
- b. School
  - 1) Teachers
  - 2) Pupils
  - 3) Parents

B. Prevents defects in manufacturing

1. Causes of poor quality

- a. Defective machines
- b. Defective tools
- c. Defective materials
- d. Poor workers

2. Results of poor quality

- a. Scrap
  - 1) Costly to produce
  - 2) Low selling price
- b. Reworking into other products

III. Why is quality control important?

A. To satisfy customers

B. To satisfy the company

- 1. More profits
- 2. More efficiency
- 3. Better reputation
- 4. More sales

C. To satisfy the workers

- 1. To increase pride
- 2. Increase skill
- 3. Incentive pay
- 4. Workers evaluation
  - a. Transparency on employee appraisal



IV. How are products tested for quality?

- A. Testing through senses
- B. Use of tools or equipment
- C. Laboratory tests
- D. Performance testing
- E. Transparency on control procedures

V. What are the stages of inspection?

A. Industry

- 1. Raw materials
- 2. Designs
- 3. Models
- 4. First part
- 5. Crucial stage
- 6. Final product

B. School products

- 1. Designs
- 2. Plans and sketches
- 3. As pupils work
- 4. Finished product

C. How can school products be evaluated?

- 1. Suggestions from pupils
- 2. Transparency on product evaluation
  - a. Design
  - b. Planning
  - c. Difficulty
  - d. Use of tools
  - e. Materials
  - f. Construction
  - g. Appearance
  - h. Accuracy
  - i. Finish
  - j. Use of time
  - k. Own work
  - l. Attitude

References:

Harold Amrine, John Ritchey, and Oliver Hulley, Manufacturing Organization and Management, pp. 277-300.

Claude George, Management in Industry, pp. 22, 516-19, 526-41, 543-61.

Observation of various school laboratory evaluation sheets

Transparencies:

Control Procedures

Employee Appraisal

Industrial Arts Product Evaluation Sheet

Title: Marketing Procedures

Presentation:

I. Pricing

A. Total cost

1. Sales expenses
  - a. Salaries of salesmen
  - b. Travel expenses
  - c. Advertising
2. Administrative expenses
  - a. Executive salaries
  - b. Secretarial salaries
  - c. Legal fees
3. Factory cost
  - a. Overhead
    - 1) Sandpaper
    - 2) Paint
    - 3) Rent
    - 4) Heat
    - 5) Lights
  - b. Prime cost
    - 1) Direct material
      - a) Material that goes directly into the product
      - b) Waste or scrap
    - 2) Direct labor
      - a) Labor that goes directly into the product
      - b) Does not include maintenance work

- B. Use an example of the above process in figuring the cost of a selected product with the information from the cost analysis and process sheet

II. Packaging

- A. For advertising value
- B. For protection of the product
- C. For convenience in handling

III. Sales

A. Advertising

1. Use of salesmen
2. Use of impersonnel media

B. Product service

#### IV. Distribution

- A. To the consumer directly
- B. To company-owned warehouses
- C. To non-owned retail outlets

#### References:

Harold T. Amrine; John A. Ritchey; Oliver S. Hulley, Manufacturing Organization and Management, pp. 317-323, 493, 502-508.

UNIT EVALUATION:

1. Observe students as they work to determine their proper use of tools, equipment and work habits in the laboratory.
2. Pupil-teacher evaluation of products.
3. Written objective test.

UNIT EVALUATION - HOUSEHOLD ACCESSORIES INDUSTRIES

True or False

Directions: Place a circle around T if the statement is true and around F if the statement is false. Read all questions carefully.

- T F One of the most important things to consider in the selection of a product is having a need for it. (True)
- T F When planning the product, it is necessary to consider how it will be used. (True)
- T F Dimensions need not be placed on sketches of products because they are unnecessary. (False)
- T F The Board of Directors of an industry is responsible to the Shop Superintendent. (False)
- T F Poor quality in products could be caused by workers. (True)
- T F The only time that industry inspects a product is when it is finished. (False)
- T F School products made by pupils are often checked for accuracy after they are designed. (True)
- T F A worker will produce better quality products if he takes pride in his work. (True)
- T F Workers are rarely evaluated or checked after they begin working in an industry. (False)
- T F When buying an item, its quality is one of the most important things to consider. (True)
- T F The Safety Engineer is not important because safety rules are for beginners. (False)
- T F It is more important for a worker to produce more products than it is for him to produce good products. (False)
- T F Laying out a pattern on metal is entirely different from laying it out on any other sheet material. (False)
- T F Accurate measurements are not important in laying out. (False)
- T F In figuring the total cost of a product, waste or scrap stock is included as a direct material. (True)
- T F A knowledge of the total cost of materials is necessary to establish the selling price of the product. (True)

Unit Evaluation - Household Accessories Industries (Continued)

- T F It is necessary to analyze drawings or sketches of a product to know what materials you will need to manufacture it. (True)
- T F The amount of time it takes to make a product is of little importance in determining what the selling price will be. (False)
- T F A block plane is designed to shear material from aluminum, brass, and other soft metals. (False)

Multiple Choice

Directions: Each of the statements below is followed by several words or phrases. Select the phrase which will best complete the statement and place its letter in the blank provided.

- \_\_\_ Which one of the following is a cutting tool?  
a. hammer  
b. hack saw  
c. mallet  
d. screw driver
- \_\_\_ Which of the following is important in the design of a product?  
a. appearance  
b. use of a T-square  
c. use of a framing square  
d. size of the plans
- \_\_\_ Which one of the following is NOT included in the total cost of manufacturing a product?  
a. direct material  
b. direct labor  
c. profit  
d. overhead
- \_\_\_ If a company has good quality products which one of the following would NOT be true?  
a. increased sales  
b. unemployed workers  
c. more profits  
d. satisfied customers
- \_\_\_ Which of the following saws would be most desirable for cutting metal?  
a. crosscut saw  
b. hack saw  
c. scroll saw  
d. miter box

Unit Evaluation - Household Accessories Industries (Continued)

Which of the following would be a marketing function?

- a. Sales
- b. Engineering
- c. Production
- d. Quality control

Which one of the following is a common layout tool?

- a. File
- b. Saw
- c. Tin snip
- d. Bench rule

Which of the following is NOT figured in the overhead when pricing a product?

- a. Rent
- b. Heat
- c. Materials that go directly into the product
- d. Lights

Which of the following is necessary in planning for the product you will manufacture?

- a. Getting the materials for the product
- b. Listing logical items that explain the procedure to be followed in manufacturing the product
- c. Inspecting the material that will be needed for the product.
- d. Cut the material to the correct size for the product

Production planning would be related to which one of the following functions of industry?

- a. Personnel management
- b. Engineering
- c. Finance
- d. Marketing

A partnership:

- a. Is made up of only one person
- b. Sells stock to finance the industry
- c. Cannot be organized on a profit-making basis
- d. Is an association of two or more people owning a business

Completion

Directions: Answer the following statements as briefly as possible in the space provided.

When finishing softwoods which contain pitch, what should you do to seal it in and prevent it from bleeding through the finish?  
(Apply a coat of shellac)

Define a household accessory.

(A device found in the home, not a necessity, but making life more comfortable and convenient.)



Unit Evaluation - Household Accessories Industries (Continued)

Name one local Household Accessories Industry.

List four ways an industry uses its money.

(Answer any four correctly:

1. Supplies
2. Wages
3. Taxes
4. Tools
5. Dividend
6. Profit)

Directions: In the following list are common forming, assembly and holding tools. Classify each tool by placing the letter A, B, or C in the spaces provided.

| A. Forming                      | B. Assembly                      | C. Holding |
|---------------------------------|----------------------------------|------------|
| <u>(C)</u> Pliers               | <u>(B)</u> Claw hammer           |            |
| <u>(A)</u> Mallet               | <u>(C)</u> Vise                  |            |
| <u>(C)</u> C-clamp              | <u>(A)</u> Hand seamer           |            |
| <u>(B)</u> Phillips screwdriver | <u>(C)</u> Bench plate           |            |
| <u>(A)</u> Ballpeen hammer      | <u>(A)</u> Slip roll former      |            |
| <u>(A)</u> Stakes               | <u>(C)</u> Adjustable hand screw |            |
| <u>(B)</u> Nail set             | <u>(A)</u> Bending brake         |            |
| <u>(A)</u> Round nose pliers    | <u>(C)</u> Bit stock or brace    |            |

Name the three classes of stain. (Oil, water, spirit)

When staining, why is it necessary to test stains before applying them to a product? (Stains should be tested first so that one will be sure he has the desired color)

When finishing, how should the end grain of the wood be treated? (The end grain should have a coat of diluted shellac or turpentine applied so that it will not darken too much when the stain is applied.)

When staining a product, what should be stained first? (The underside of the project should be stained first, as this will not ordinarily be seen and also allows for a testing area)

Hardwoods or close grain woods should be sealed with (shellac) ?

What would be a good way for a manufacturer of paint to test his product? (Test through use)

Why should a laboratory be thoroughly cleaned at the end of each class? (Neatness, safety)

Unit Evaluation - Household Accessories Industries (Continued)

Matching

Directions: Place the number of the item on the right in front of the appropriate item on the left. More than one number may be placed in front of the items on the left. All nine of the items on the right must be used. One point for each item correctly placed on the left.

- |                                      |                                                   |
|--------------------------------------|---------------------------------------------------|
| <u>(4,7)</u> Direct material         | 1. Advertising                                    |
| <u>(3)</u> Direct labor              | 2. Salaries of executives                         |
| <u>(5,6)</u> Overhead                | 3. Labor that goes directly into<br>the product   |
| <u>(1,8)</u> Sales expenses          | 4. Scrap or waste material                        |
| <u>(2,9)</u> Administrative expenses | 5. Rent                                           |
|                                      | 6. Light                                          |
|                                      | 7. Materials that go directly into<br>the product |
|                                      | 8. Salaries of salesmen                           |
|                                      | 9. Secretarial salaries                           |

TITLE OF UNIT

LAWN AND GARDEN ACCESSORIES INDUSTRIES

TEACHING TEAM

DANIEL L. BREY  
GLEN O. HAYES  
RODNEY H. HOFFMAN  
RAY O. JONES  
WILLIAM E. SMITH

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College  
Gorham, Maine

July 1 - August 9, 1968

## INTRODUCTION:

Industry - the instrument of society for the application of technology, has a continual affect on all individuals. In life as well as industry, the law of "survival of the fittest" applies. Most of us do not properly consider, or are aware of the affect of, the many fad items which appear on the market today and are gone tomorrow. This unit will be concerned with a study of those industries which must get their products on the market quickly.

The Lawn and Garden Accessories Industries introduce an area which is diversified and flexible, permitting as many directions or approaches as the imagination can pursue. It can be studied from custom or job production or from the concept of mass or continuous production. Products produced by these industries may be very elementary or involve very complicated construction.

As an industry which employs hundreds of thousands of people throughout the nation, particularly during the early spring and summer months, and because of the many novelty lawn and garden accessories which appear on the market in rapid succession to capture public appeal, these industries provide natural student appeal as they are made aware of competition and the problems of marketing a product quickly.

SCOPE:

This unit is designed for 8<sup>th</sup> grade boys and girls who have completed an introductory unit in manufacturing. It will serve the pupil and teacher as a short intensive unit to complete time requirements of an industrial arts course. Its intent is to provide flexibility so that the objectives can be achieved regardless of allotted time.

Unit emphasis will be on forming partnerships, meeting competition, and marketing a product quickly. Products shall be characteristic of the lawn and garden accessories industries and may be fabricated from a variety of available materials.

**OBJECTIVE 1:** To develop an understanding of an insight to the lawn and garden accessories industries and their place in our society

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                     | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TEACHER LESSONS                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>1. Identify local industries which manufacture lawn and garden accessories and recognize the effect of these on employment and the economy</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. List several local lawn and garden accessories industries</li> <li>b. Tour a local lawn and garden accessories industry</li> <li>c. Look through the yellow pages for names of lawn and garden accessories industries</li> <li>d. Look through local buyers guides for names of lawn and garden accessories industries</li> <li>e. Look through catalogs for examples of products which are produced by lawn and garden accessories industries</li> </ol> | <p>Local Lawn and Garden Accessories Industries and their Effect on Employment and the Economy</p> |

OBJECTIVE 1: To develop an understanding of an insight to the lawn and garden accessories industries and their place in our society

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                         | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                          | TEACHER LESSONS |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>2. List the types of jobs or employment opportunities in the lawn and garden accessories industries.</li> <li>3. Explain the differences in types of ownership</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. f. Visit local stores and identify manufactured lawn and garden accessories</li> <li>g. Plan a program for getting a product on the market quickly</li> <li>2. a. Compare shop organization personnel with that of industry</li> <li>3. c. Establish themselves in teams as partners in business</li> </ol> |                 |

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                               | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEACHER LESSONS                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>1. Apply principles of design pertinent to products of these industries.</li> <li>2. Follow logical procedure in selecting a product</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. Look through appropriate catalogs for designs presently in use</li> <li>    b. Identify design principles in sample accessories</li> <li>2. a. Look through appropriate catalogs for product ideas</li> <li>    b. Compare possible products</li> <li>    c. Use criteria for production and marketing</li> <li>    d. Use brainstorming session for selection of product</li> </ol> | <p>Crash Programming a New Product</p> |



OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                                                                                                                                                                                                 | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TEACHER LESSONS |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>3. Make working sketches or drawings of selected product</li> <li>4. Analyze drawings or sketches for materials needed</li> <li>5. Analyze drawings or sketches for procedures and/or construction details</li> <li>6. Recognize and/or obtain the materials selected</li> <li>7. Recognize and use simple layout tools and procedures</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>3. a. Sketch the proposed product</li> <li>   b. Examine industrial sketches or drawings for content</li> <li>4. a. Complete a cost analysis sheet</li> <li>5. a. Examine a process sheet used by industry</li> <li>   b. Construct a flow chart for the manufacture of product</li> <li>6. a. Select materials for manufactured product</li> <li>7. a. Locate layout tools in laboratory</li> <li>   b. List simple layout tools</li> </ol> |                 |

**OBJECTIVE 2:** To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

| EXPECTED BEHAVIORAL CHANGES                                                 | PUPIL ACTIVITIES                                                                                                                                                                                                         | TEACHER LESSONS |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <p>The pupils will be able to:</p>                                          | <p>Have pupils:</p>                                                                                                                                                                                                      |                 |
| <p>7. c. Use simple layout tools on selected product</p>                    | <p>d. Demonstrate use of layout tools to classmates</p>                                                                                                                                                                  |                 |
| <p>8. Recognize and use simple tools and procedures</p>                     | <p>8. a. Locate cutting tools in laboratory</p> <p>b. List simple cutting tools</p> <p>c. Use simple cutting tools on selected product</p>                                                                               |                 |
| <p>9. Recognize and use simple forming and shaping tools and procedures</p> | <p>9. a. Locate forming and shaping tools in the laboratory</p> <p>b. List simple forming and shaping tools found on the manufacturing tool panel</p> <p>c. Use simple forming and shaping tools on selected product</p> |                 |

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                           | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                  | TEACHER LESSONS                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <p>The pupils will be able to:</p> <p>10. Recognize and use simple holding tools and procedures</p> <p>11. Recognize and use simple assembly tools and procedures</p> | <p>Have pupils:</p> <p>10. a. Locate holding tools in the laboratory</p> <p>b. Use simple holding tools on selected product</p> <p>11. a. Locate assembly tools on manufacturing panel</p> <p>b. List simple assembly tools</p> <p>c. Use simple assembled tools on selected product</p> <p>d. Conduct experiments on strength of fasteners</p> <p>e. View film "The Factory"</p> | <p>Simple Assembly Tools and Procedures</p> |

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                             | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TEACHER LESSONS                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <p>The pupils will be able to:</p> <p>12. Recognize and use simple finishing equipment and procedures</p> <p>13. Inspect product and use suitable testing procedure</p> | <p>Have pupils:</p> <p>12. a. Locate finishing materials in the laboratory</p> <p>b. Prepare a list of common finishes for materials often used in these industries</p> <p>c. Use simple finishing materials and techniques on selected product</p> <p>13. a. Evaluate manufactured product</p> <p>b. Compare industrial inspection techniques and relate to manufactured products</p> <p>c. Prepare an inspection form for use in laboratory</p> <p>d. Inspect mass-produced product for defects and function</p> | <p>Finishing Methods and Procedures</p> |

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                  | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEACHER LESSONS            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <p>The pupils will be able to:</p> <p>14. Recognize packaging, labeling and distribution procedures</p> <p>15. Use pricing techniques to determine sale value of product</p> | <p>Have pupils:</p> <p>14. a. Package and label his product</p> <p>b. Display typical packaging materials from industry</p> <p>c. Visit local stores and observe packaging and labeling</p> <p>d. Discuss procedures used to get product to distribution centers or terminals</p> <p>e. Design label to attach to product</p> <p>f. Print label to attach to product</p> <p>15. a. Determine the material costs of his product</p> <p>b. Estimate hours needed to produce product</p> | <p>Marketing Procedure</p> |

OBJECTIVE 2: To develop skill in the use of the tools, machines, and equipment of the Lawn and Garden Accessories industries and their related processes.

| EXPECTED BEHAVIORAL CHANGES        | PUPIL ACTIVITIES                                                                                                                                                                                                                                    | TEACHER LESSONS |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <p>The pupils will be able to:</p> | <p>Have pupils:</p> <ul style="list-style-type: none"> <li>15. c. Estimate selling price of product</li> <li>d. Compare selling price with similar industry-produced products</li> <li>e. Develop cost pricing charts for laboratory use</li> </ul> |                 |

OBJECTIVE 3: To develop desirable attitudes and respect for work, the worker, and  
 for the products of the Lawn and Garden accessories industries

| EXPECTED BEHAVIORAL CHANGES                                                                                                          | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                             | TEACHER LESSONS                                 |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>1. Work cooperatively with members of his class</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. Participate in the personnel organization</li> <li>b. Assist others in their tasks on production line</li> <li>c. Follow policies for laboratory operation</li> <li>d. Begin construction of several products for those who have not completed previous products</li> </ol> | <p>Included in all lessons where applicable</p> |
| <ol style="list-style-type: none"> <li>2. Care for tools, equipment and facilities</li> </ol>                                        | <ol style="list-style-type: none"> <li>2. a. Return tools to panel when finished with them</li> <li>b. Clean up work area</li> <li>c. Participate in partnership organization</li> </ol>                                                                                                                                                     | <p>Included in all lessons where applicable</p> |
| <ol style="list-style-type: none"> <li>3. Observe safety standards, posters, signs, and regulations</li> </ol>                       | <ol style="list-style-type: none"> <li>3. a. Observe safety signs on machines</li> <li>b. Wear proper safety clothing and use safety devices</li> </ol>                                                                                                                                                                                      | <p>Included in all lessons where applicable</p> |

**APPROACH:**

1. Show samples of Lawn and Garden Accessories produced by industry.
2. Lead sales discussion on how we must produce a product to meet competition.
3. View film The Factory to introduce line production in industry.



RESOURCE MATERIAL:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T., Ritchey, John A., and Hully, Oliver S., Manufacturing Organization and Management, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966.

Bittle, Lester R., What Every Supervisor Should Know, New York: McGraw Hill Book Company, Inc., 1959.

Eisenberg, James and Kafka, Francis J., Silk Screen Printing, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1957.

Gergracht, Carl and Robinson, Frank E., Understanding America's Industries, Bloomington, Illinois: McKnight and McKnight Publishing Company, 1962.

Industry Profiles, U. S. Department of Commerce Business and Defense Services Administration, 1958-1965.

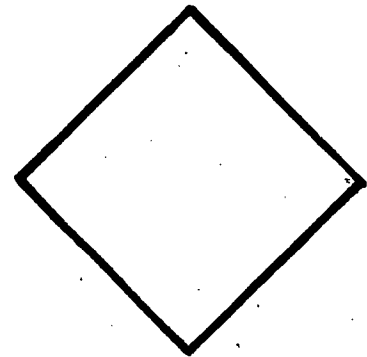
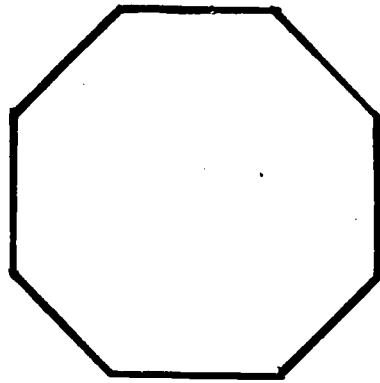
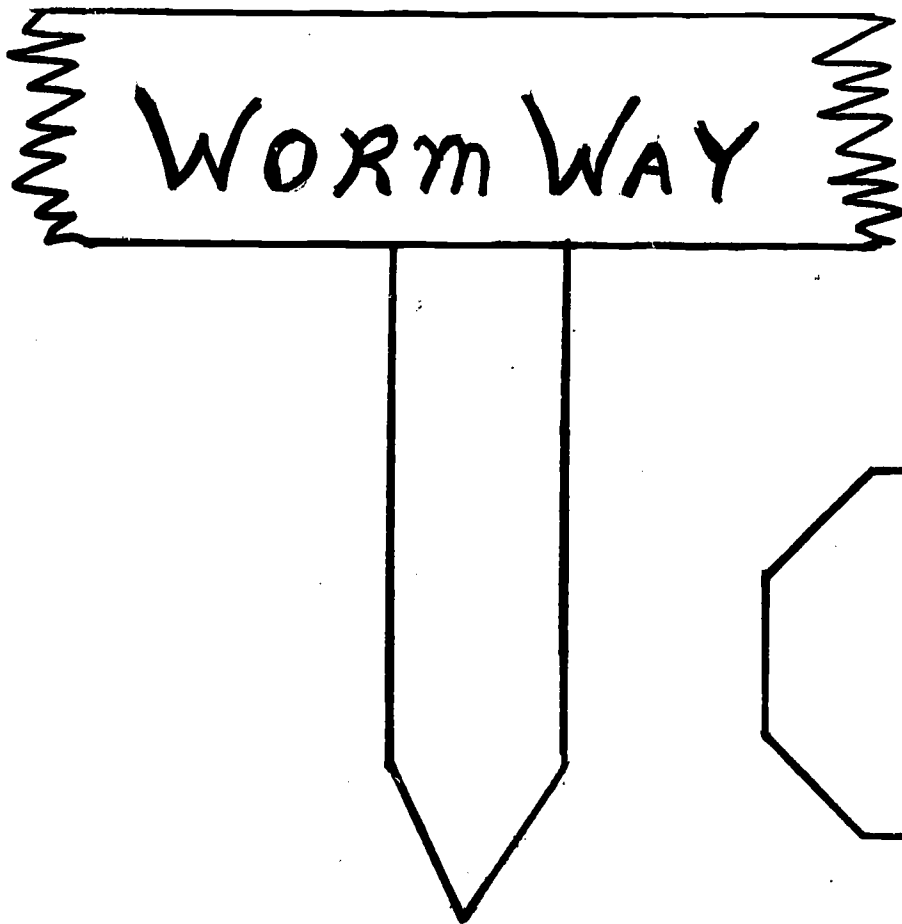
Keane, George R., Teaching Industry Through Production, Washington, D. C.: American Industrial Arts Association, 1963.

RESOURCE MATERIALS:

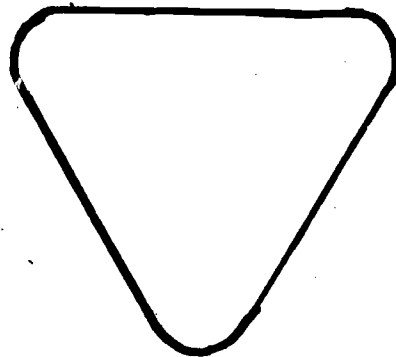
B. TEACHING AIDS OR DEVICES

1. Sample of factory-produced sign
2. Samples of suggested designs and slogans
3. Assembly line flow chart
4. Film: The Factory, How a Product is Made. #11684 -  
University of Michigan Audio Visual Education Center,  
720 E. Huron Street, Ann Arbor, Michigan. Cost: \$6.50
5. Sample School Products, Inc. check
6. Sample label

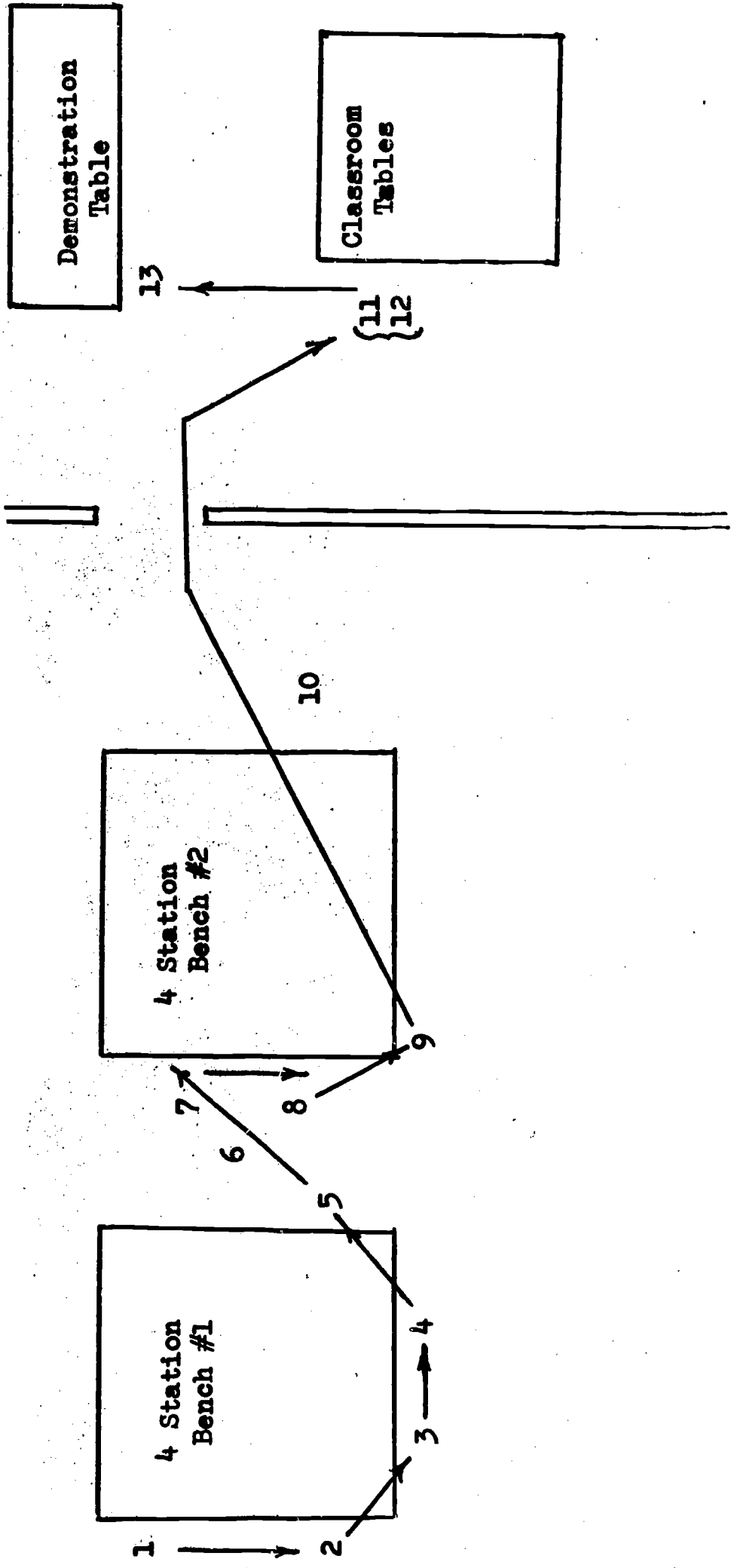
SAMPLE PATTERNS and SLOGANS



Alternate Sign Patterns



- Deer path
- Dear crossing
- Worm crossing
- Chicken path
- Pig crossing
- Bear path
- Horse trail
- People path
- Worm Way
- Chipmunk crossing
- Bare crossing
- Foot path
- Tramp trale
- Bear bridge
- People patch
- Womens way
- Rite-of-way
- Crosscut
- Main-e-ac Crossin



1. Place sign and stake together
2. Place glue onto stake
3. Place sign and stake into fixture
4. Staple stake onto sign
5. Set staples and Inspection
6. Transfer signs to bench #2
7. Wrap advertising material around stake

8. Staple advertising sheet together
9. Inspection
10. Transfer to classroom tables
11. Pricing
12. Pricing
13. Arrange into groups and prepare for sale

ASSEMBLY LINE FLOW CHART FOR LAWN SIGNS



PAY PERIOD ENDING \_\_\_\_\_ 19\_\_

DATE \_\_\_\_\_ 19\_\_ SOC. SEC. NO. \_\_\_\_\_

|                   |  |  |  |  |  |
|-------------------|--|--|--|--|--|
| NAME              |  |  |  |  |  |
| REGULAR EARNINGS  |  |  |  |  |  |
| OVERTIME EARNINGS |  |  |  |  |  |
| GROSS EARNINGS    |  |  |  |  |  |
| F. I. C. A.       |  |  |  |  |  |
| WITHOLDING TAX    |  |  |  |  |  |
|                   |  |  |  |  |  |
|                   |  |  |  |  |  |
| TOTAL DEDUCTIONS  |  |  |  |  |  |
| AMOUNT THIS CHECK |  |  |  |  |  |

**SCHOOL PRODUCTS, INC.**

No. 52-69  
3214

19\_\_

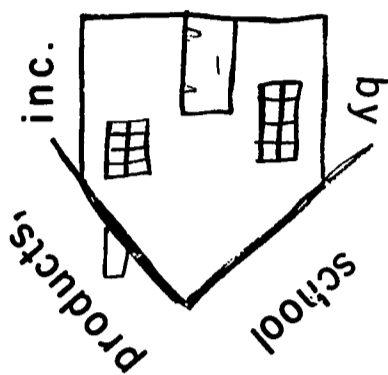
DAY TO THE ORDER OF \$ \_\_\_\_\_

\_\_\_\_\_ DOLLARS

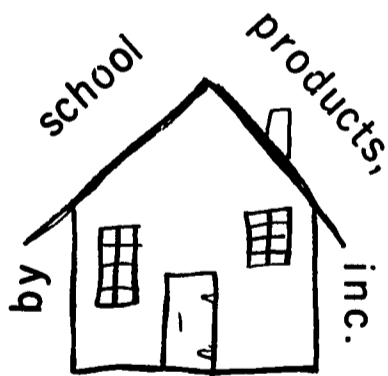
SAMPLE — NOT VALID

**THE FIRST NATIONAL BANK**

⑆3214⑆0069⑆ 987⑆654 3⑆



Leprechaun trails are  
very rare.  
When you find one  
Imbed a Trail-  
Blazer there-  
use care



# LEPRECHAUN TRAIL BLAZERS

**TOOLS AND EQUIPMENT:**

1. Silk screen equipment
2. Staple gun
3. Platen press and type
4. Dipping tray
5. Drying rack
6. 16mm projector and screen

**MATERIALS AND SUPPLIES:**

1. Pine
  - 1/4" x 1" - assorted lengths
  - 1/4" x 2" - " "
2. Paper for labels
3. Silk screen enamel
4. Exterior varnish
5. Staples, 9/16"

**LESSONS TO BE TAUGHT:**

**Local Lawn and Garden Accessories Industries and their  
Effect on Employment and Economy**

**Crash Programming a Product**

**Simple Assembly Tools and Procedures**

**Finishing Methods and Procedures**

**Marketing Procedures**



Title: Local Lawn and Garden Accessories Industries and their  
Effect on Employment and Economy

Presentation:

I. Define the term "Lawn and Garden Accessory."

- A. An item to add to the lawn or garden for convenience,  
comfort or decoration.

II. Local industries

A. Effect on employment

1. Varies with location
2. Seasonal employment

B. Effect on economy

1. Seasonal effect

III. National industries

A. Employment

1. Employs several hundred thousand people

B. Economy

1. Payroll about \$672.544 per year

IV. Competition

A. Define

1. Rivalry, the struggle to maintain or obtain an  
advantage over another person or company

B. Effect of competition on industry

1. Industries copy ideas of others

a. Patent rights

1) Define

- a) A right granted by the government to protect  
an item from being copied by others

(1) Avoid by changing the design slightly

2. Cornering the market

a. Define

- 1) A company getting to be sole producer of an item

References:

U. S. Department of Commerce, Industry Profiles, 1958-1965.

Title: Crash Programming a Product

Presentation:

- I. Routine for planning a crash program of a new product
  - A. Define "crash program"
    1. An all out effort to get a product on the market as rapidly as possible
  - B. To take advantage of selling a "fad" item
  - C. Forming an idea
    1. Copy from others, changing designs slightly
    2. From individual research
  - D. Engineering a product
    1. Study for improvements
    2. Change to avoid others' patent rights
  - E. Engineering manufacturing
    1. Choose best material
      - a. Fastest to fabricate
      - b. Cheap to fabricate
      - c. Durable for the expected length of the fad
    2. Route production
      - a. Fastest method
      - b. Easiest method

References:

Lester R. Bittle, What Every Supervisor Should Know, pp. 124-148.

Title: Simple Assembly Tools and Procedures

Presentation:

I. Assembly procedure

A. Method used

1. Assembly line

a. Define

- 1) A method of assembly where each worker completes only one operation in the construction of a product

b. Typical operations

- 1) Gathering materials together
- 2) Placing parts into fixtures
  - a) Define fixture
    - (1) A device used to hold materials in a given position
- 3) Inspection
- 4) Assembly of parts
- 5) Transferring to specific laboratory areas for further assembly
- 6) Packaging
  - a) Method used
    - (1) Paper giving sales slogan and product name
- 7) Pricing
  - a) Estimation of materials used
  - b) Estimation of hours worked
  - c) Determine profit desired
  - d) Final selling price
- 8) Preparation of product for final sale

II. Assembly tools

A. Meaning of assembly

1. Placing the part of the product together

B. Methods used

1. Glue

a. Reason for using

- 1) To give added strength to staples

2. Staples

a. Reason for using

- 1) Ease of operation
- 2) Quick to apply
- 3) Sufficient strength when used with glue

b. Methods of using staples

- 1) Power staple gun
- 2) Hand desk stapler

III. Exact procedure of assembly for lawn signs

A. Method described in flow chart on following page

References:

Carl Gerbracht and Frank Robinson, Understanding America's Industries, p. 223.

Geroge R. Keane, Teaching Industry Through Production, pp. 17-23.

Title: Finishing Materials and Methods

Presentation:

## I. Dipping

### A. Definition

1. The process of immersing a product into a bath of the finishing material which serves to coat the product

### B. Selection of finish

1. Lacquer
2. Shellac
3. Creosote
4. Varnish

#### a. Cutting

- 1) Definition - thinning the varnish with turpentine to give it the required consistency
- 2) 50% diluted
  - a) Advantages
    - (1) Quick
    - (2) Easy
    - (3) Even coating
  - b) Disadvantages
    - (1) Wastes material
    - (2) Finish buildup on lower edges
- 3) 25% diluted
  - a) Advantages
    - (1) Thin, many coats
  - b) Disadvantages
    - (1) Dries quickly
    - (2) Seals pores

## II. Silk screening

### A. Define

1. A stencil method of printing, using a fine porous fabric stretched tightly across a frame
2. Similarity to paper stencil

### B. Ink

1. Type
2. Drying time
3. Colors

### C. Squeegee

1. Sizes
2. Cleaning

D. Screen

1. Made from silk
2. Cleaned
3. Mounting
  - a. Frame
  - b. Hinge

E. Process

1. Ink screen
2. Insert material to be printed
3. Pull squeegee over screen
4. Lift top
5. Remove product

References:

James Eisenberg and Francis Kafka, Silk Screen Printing, Scan

Title: Marketing

Presentation:

I. Functions of Marketing

- A. Market research
- B. Advertising
- C. Sales promotion
- D. Sales planning
- E. Sales operations
- F. Physical distribution
- G. Pricing
- H. Packaging

- 1. Definition
  - a. Preparation of the final product for shipment and/or sale
- 2. Purpose
  - a. Protection
  - b. Advertising
- 3. Types
  - a. Plastic bag
  - b. Boxes
  - c. Wrapping paper
  - d. Cards
  - e. Wrap-around tag
- 4. Selection of package design
  - a. Name of product
    - 1) Slogans to correspond to this name
  - b. Shape of product
    - 1) Determines type of package
    - 2) Determines how package will be attached
- 5. Production of package
  - a. Cut paper stock to correct size
  - b. Print trade-mark of company
  - c. Set type for advertising on label
  - d. Students print labels
  - e. Attach label to product

References:

Harold T. Amrine, John A. Ritchey, and Oliver S. Hulley,  
Manufacturing Organization and Management, pp. 176, 495-509

UNIT EVALUATION:

1. Observe students as they work to determine their proper use of tools, equipment and work habits in the laboratory.
2. Written objective test.
3. Evaluation of line production techniques.
4. Comparison of custom and line production product costs.



UNIT EVALUATION - LAWN AND GARDEN ACCESSORIES INDUSTRIES

True or False

Directions: Place a circle around T if the statement is true and around F if the statement is false. Read all questions carefully.

- T F Packaging can be defined as the preparation of the final product for shipment and/or sale. (True)
- T F The package design is important to the sales of a product. (True)
- T F Dipping is a finishing process. (True)
- T F Lacquer is a suitable dipping material for an outdoor sign. (False)
- T F Shellac is an animal product. (True)
- T F Creosote is an excellent preserver. (True)
- T F Varnish is a color pigment. (False)
- T F Silk screening is a process similar to stenciling. (True)
- T F Silk screening is done best using an enamel paint. (False)
- T F Silk screening can be done in only one color. (False)
- T F The squeegee is the name of the tool used to stretch the silk screen on the frame. (False)
- T F An assembly line is where each worker builds a complete product. (False)
- T F A fixture is used to hold parts during the assembly operation. (True)
- T F Inspection is necessary to be sure that the product is of good quality. (True)
- T F Some workers are used to move products from place to place on the assembly line. (True)
- T F Mass production is one of the most expensive methods to produce a product. (False)
- T F Stapling is a very unsatisfactory assembly method. (False)
- T F Assembly is the layout of the parts onto materials. (False)
- T F Glue is used to give added strength to the product. (True)
- T F Another term for competition could be rivalry. (True)

T F A patent right is granted by an industry to protect designs from being copied. (False)

### Multiple Choice

Directions: Each of the statements below is followed by several words or phrases. Select the phrase which will best complete the statement and place its letter in the blank provided.

- \_\_\_ Dipping is a process of (b)
- a. grinding
  - b. finishing
  - c. polishing
  - d. silk screening
- \_\_\_ Lacquer has which of the following characteristics: (c)
- a. Durable when exposed to weather
  - b. Has a very opaque color
  - c. Very clear
  - d. Easy to apply
- \_\_\_ Which one of the following is NOT a purpose of a package? (b)
- a. Protect the product
  - b. Give more people work
  - c. Help advertise the product
  - d. Look nice for more sales appeal
- \_\_\_ Which of the following (is) (are) true of shellac? (a, b, c)
- a. Discolors very easily
  - b. Resins or pitch will not bleed through
  - c. Relatively inexpensive
  - d. Withstands weathering very well
- \_\_\_ Creosote is used for (a, b)
- a. A preservative
  - b. Paint
  - c. Staining
  - d. Cleaning
- \_\_\_ Varnish is a good finish because it (a, d)
- a. Is easy to apply
  - b. Dries rapidly and dust-free
  - c. Does not require a clean brush
  - d. Is very hard and durable

## Completion

Directions: Answer the following statement as briefly as possible in the space provided.

What is meant by the term "cornering" a market?  
(Being the sole producer of a product)

What is a lawn and garden accessory?  
(Adds convenience, comfort or decoration to lawn or garden)

Define the silk screening process.  
(A stencil method of printing, using a fine, porous fabric stretched tightly across a frame)

Define the dipping process giving the advantages and disadvantages.  
(The dipping process is a method of finishing a product by immersing in a bath of the finishing material which gives it a coating of the material. The advantages are that it is a very quick and easy process. It gives a very even coating. The disadvantage is that it wastes a lot of material and the finish build-up on the lower edges.)

List 5 different types or kinds of packages.

- 1.
- 2.
- 3.
- 4.
- 5.

The \_\_\_\_\_ process is similar to stenciling. (silk screening)

\_\_\_\_\_ is used for cleaning the silk screening equipment.  
(mineral spirits)

\_\_\_\_\_ and \_\_\_\_\_ are used as the fabric for silk screening.  
(taffeta and organdy)

The best clear finish for an outdoor sign is \_\_\_\_\_. (varnish)

The material best suited for a wood preservative is \_\_\_\_\_. (creosote)

To cut a finishing material means to \_\_\_\_\_. (thin)

TITLE OF UNIT

INTRODUCTION TO TECHNOLOGY AND INDUSTRIAL ARTS

TEACHING TEAM

GARDNER SHERMAN  
HERALD KIEWER  
KENNETH WASSON  
CHARLES FERDEN  
CHARLES PADDOCK

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

"LABORATORY OF INDUSTRIES"

Department of Industrial Education and Technology

Gorham State College  
Gorham, Maine

July 1 - August 9, 1968

## INTRODUCTION:

Today we live in an amazing and fascinating world full of literally thousands of gadgets and products which are the results of our ever-increasing and ever-changing technology, ranging in all degrees of complexity.

This technology is inherent in food we eat, the clothes we wear, the homes we live in, the way we travel and communicate and the way we spend our leisure hours.

It should be the role of the school, then, to provide youth with such understandings of this technology and its prime user, "industry," so that he may better find his role as a producer and consumer of its fruits.

Industrial arts as a curriculum area is ideally suited to reflect the spirit of this technology: the significance and application of research, the inventiveness and creativity of man and his technical problem-solving skills, and the interplay of human relations. This introductory unit will help reveal to the pupils the wonders and scope of technology and how they may become a part of its evolution.

SCOPE:

This unit may be used as an introduction to industrial arts and the laboratory. It is designed for youngsters who have not experienced industrial arts and should not exceed one week.

OBJECTIVE 1: To develop an understanding of industrial arts, its purpose and relationship to industry and technology

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                                                                                                                       | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                     | TEACHER LESSONS                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <p>The pupil will be able to:</p> <ol style="list-style-type: none"> <li>1. Recognize the role and objectives of industrial arts in education</li> <li>2. Relate the importance of industry and technology to society</li> <li>3. Explain the history and development of civilization and how tools affected technological development</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. Fill out interest form</li> <li>    b. Discuss education and its purpose</li> <li>2. Discuss the role of technology in society</li> <li>3. a. Discuss the development of tools</li> <li>    b. Prepare an exhibit of tools</li> <li>    c. Make identification tags to develop custom production concept</li> </ol> | <p>Introduction to Industrial Arts and Technology</p> <p>Technology and Its Effect on the History and Development of Civilization</p> |

OBJECTIVE 2: To develop desirable attitudes toward the organization and procedure in the industrial arts laboratory

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                 | PUPIL ACTIVITIES                                                                                                                                                                                                                                                           | TEACHER LESSONS                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| <p>The pupil will be able to:</p> <ol style="list-style-type: none"> <li>1. Recognize the importance of safety to himself and those around him</li> <li>2. Assume responsibility</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. Observe safety devices and regulations</li> <li>    b. Point out safety on laboratory tour</li> <li>2. a. Return tools and equipment to proper place</li> <li>    b. Clean up after their work</li> </ol> | <p>General Safety in the Laboratory</p> |



APPROACH:

1. Welcome students to the laboratory.
2. Have students complete interest inventory.
3. Take students on laboratory tour and demonstrate briefly
  - a. Evolution of drill
    - 1) flintstone
    - 2) early bow drill
    - 3) electric drill
  - b. Wood lathe
  - c. Metal lathe
  - d. Honajector
  - e. Jointer
  - f. Thickness planer
  - g. Belt sander
  - h. Scroll saw
  - i. Band saw

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Bureau of Vocational Education, Industrial Arts Technology, Augusta, Maine: Department of Education, 1963.

Gerbracht, Carl and Robinson, Frank, Understanding America's Industries, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963.

Olson, Delmar W., Industrial Arts and Technology, Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1963.

RESOURCE MATERIALS:

B. TEACHING AIDS OR DEVICES

1. Charts

- a. Productivity Creates All Economic Growth, DoAll Corporation, 254 North Laurel Avenue, Des Plaines, Illinois, (Price \$1.00)
- b. Why Living Improves in America, (same source as above)

2. Transparencies

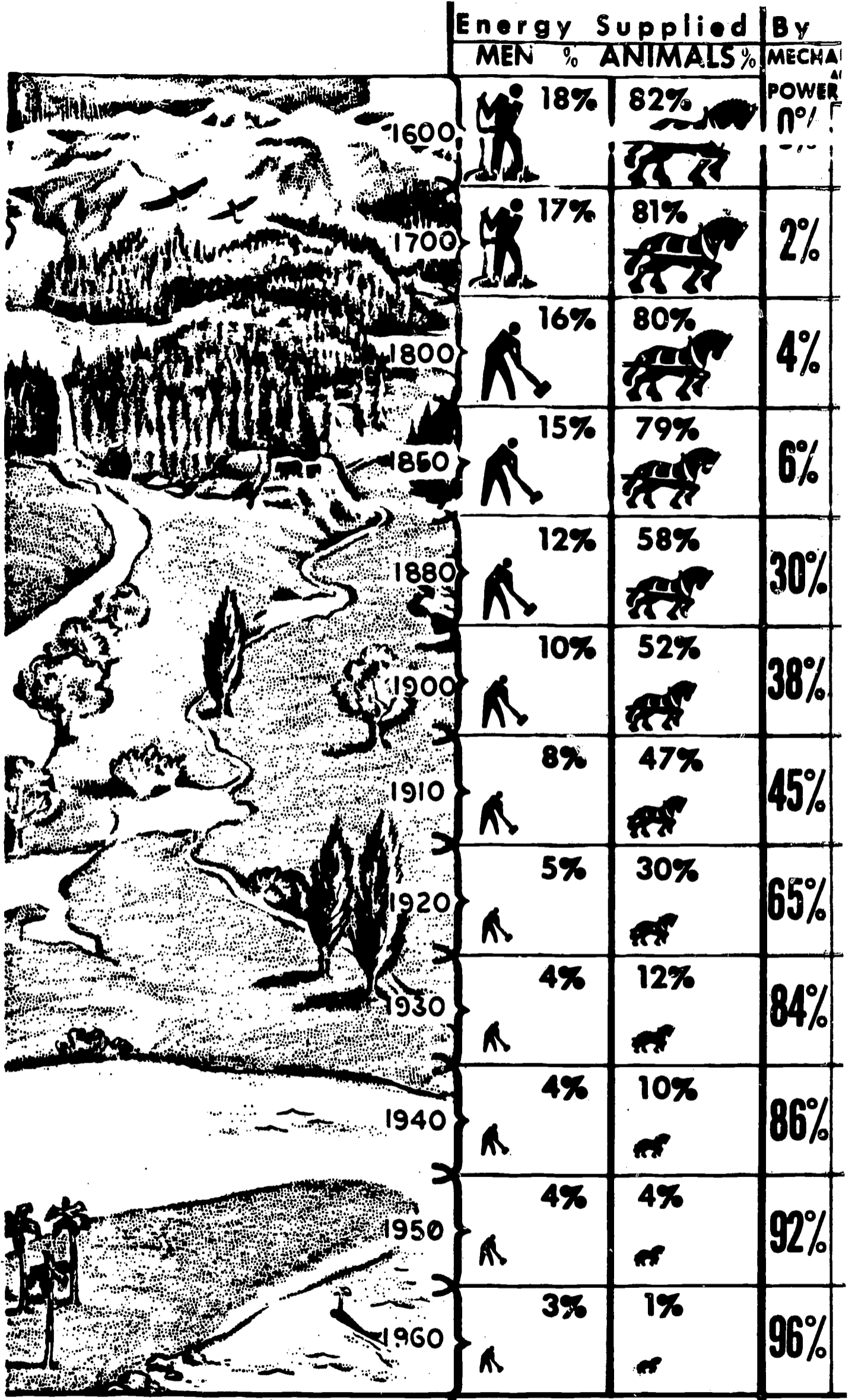
- a. Sections of Chart b
- b. Stages of American Technology

3. Models and specimens

- a. Bow drill
- b. Bit brace
- c. Cut-away of small engine
- d. Others readily available

Energy supplied by men and animals has reduced over the years, because of the development of tools and power.

Adapted from:- Chart ( Why Living Improves in America ), DoAll Corporation,  
254 North Laurel Avenue, Des Plaines, Illinois, ( Price \$1.00 )



STAGES OF AMERICAN TECHNOLOGY

| Period | Stage         | Power                                                | Material..                                 | Process                                                                             | Work                                                 |
|--------|---------------|------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|
| 1608   | Handcraft     | Muscle:<br>Man, Animal                               | Wood, Iron, Bronze,<br>Clay, Glass         | Hand, Hand Tool                                                                     | The Craftsman makes the complete product             |
| 1800   | Machine       | Wind, water,<br>Electric motor,<br>combustion engine | Steel, alloys,<br>aluminum                 | Machine tool                                                                        | Craftsman specializes in job operations<br>Inventors |
| 1900   | Power         | Portable internal combustion engine                  |                                            | Mechanization,<br>mass production                                                   | The Craftsman becomes a machine operator             |
| 1915   | Production    | Portable electric motor                              |                                            | Assembly line,<br>automatic machines,<br>electric, hydraulic,<br>pneumatic controls | Assembly Man<br>Need for Engineers                   |
| 1940   | Research      |                                                      | Synthetics,<br>plastics, man-made elements |                                                                                     | Scientist<br>Researcher                              |
| 1952   | Automation    | Miniaturization                                      | High refractory metals, ceramics, plastics | Electronic controls                                                                 | Human Engineering<br>Technician<br>Servicing         |
| 1960   | Nuclear-Space | Atomic, Solar                                        | New materials for special purposes         | Automated factories                                                                 | The technician and service worker specialize         |

INTEREST INVENTORY

I. Your Family Student Number \_\_\_\_\_  
Your name \_\_\_\_\_ Age (last birthday) \_\_\_\_\_  
Your street address \_\_\_\_\_ Home phone \_\_\_\_\_  
Your father's name (or male guardian) \_\_\_\_\_  
Place your father works \_\_\_\_\_ Bus. phone \_\_\_\_\_  
Your mother's name (or female guardian) \_\_\_\_\_  
Place your mother works \_\_\_\_\_ Bus. phone \_\_\_\_\_  
Number of other children in family living at home \_\_\_\_\_

II. Your Education  
Approximate grade average in the last two years in school \_\_\_\_\_  
Classes you like most \_\_\_\_\_  
Classes you like least \_\_\_\_\_  
Why did you decide to take this class? \_\_\_\_\_  
\_\_\_\_\_  
What would you like to build in the laboratory? \_\_\_\_\_  
\_\_\_\_\_

III. Your Interests  
What is your hobby? \_\_\_\_\_  
What clubs do you belong to? \_\_\_\_\_  
What kind of offices have you held? \_\_\_\_\_  
What kind of books do you like to read? \_\_\_\_\_  
What magazines do you read? \_\_\_\_\_

IV. Your Future  
What kind of program would you like to take when you get to high school: college preparatory, business, technical/vocational or vocational? \_\_\_\_\_  
What kind of work would you like to do as a vocation? \_\_\_\_\_  
\_\_\_\_\_  
Have you talked to anyone in this occupation? \_\_\_\_\_  
If so, who? \_\_\_\_\_

TOOLS AND EQUIPMENT:

1. Dymo tape writer
2. Hermes engraver
3. Honajector
4. Overhead projector
5. Projection screen

MATERIALS AND SUPPLIES:

1. Scrap plastic, wood, and metal
2. Plastic spray finish
3. Pin backs
4. Airplane cement
5. Alphabet noodles

LESSONS TO BE TAUGHT:

Introduction to Technology and Industrial Arts

Technology and its Effect on the History and Development  
of Civilization

General Safety in the Industrial Arts Laboratory



Title: Introduction to Technology and Industrial Arts

Presentation:

- I. Personnel and procedures of the laboratory of industry
  - A. Introduction of teacher and pupils
  - B. Interest inventory
  - C. Attendance
  - D. Locker assignments
  - E. Fire exits
  - F. Entrance procedure
  - G. Rest room
  - H. Clothing
- II. Role of industrial arts in general education, its purposes, relationship to technology, industry and industrial arts
  - A. Definition of terms
    1. Industry
    2. Technology
    3. Industrial arts
  - B. Technology in industry
  - C. Technology in our society
  - D. Technology in our own lives
  - E. Preparation in schools of young people to live in a technical society
- III. Expectations of industrial arts
  - A. Student opinion of industrial arts
  - B. Manufacturing
    1. Custom production
    2. Mass production

Reference:

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 2-4.

Title: Technology and its Effect on the History and Development  
of Civilization

Presentation:

I. Development of tools and machines

A. Natural resources can't be effectively changed by man

B. Man can't change his human energy

1. Man is an animal

2. Birds, fish and animals use their features for protection, find food and shelter

3. Man can think and reason

a. Create tools and machines

b. Tools are extensions of man's hands and feet

C. From 1608 to 1960, man has used less of his own energy, less animal power and more power and machinery

1. 1608 - 18% human energy - 82% animal energy

2. 1960 - 3% human energy - 1% animal energy

II. Specific development of drilling

A. Flint stone

B. Rolling flint stone drills in hands

C. Bow drill

D. Hand auger

E. Wooden bit brace

1. Craftsman made own tools

2. Relate to modern bit brace

F. Electric drill

G. Drill press

1. Multiple drills

2. Tape, fluid, air and electronic control

H. Various types of drill bits developed

1. New types
  - a. Screw mate
  - b. Speed bore
2. Variations of twist drill
  - a. Machine bit for wood
  - b. C'bore and drill on single shaft

III. Ability of man to develop tools and machines is responsible for the development of civilization

A. Tools alone not responsible

1. Engineers
2. Management
3. Money
4. Salesman

B. Tools and machines necessary for above to function

C. Foreign countries still using methods of years ago

1. Water buffalo - plow in the rice paddies
2. Reason
  - a. Limited development of tools and machines
  - b. Limited manufacturing by industry

D. United States has 6% of world population, 76% of world automobiles

E. What is technology?

1. Applied science
2. Demand for new and better machines

IV. Stages of American technology by Olson

A. Changing need for tools and machines

1. Reasons
  - a. Development of power source
  - b. New materials
  - c. Research
2. Results

B. Change in the role of the worker

1. Craftsman
2. Craftsman specialized
3. Machine operator
4. Assembly man
5. Researcher - engineer
6. Technician
7. Specializing technician and service worker

C. What next?

1. Robot
2. Computer controlled factories

V. Summary

A. Importance of tools and machines in the development of civilization

B. Technology has developed many new materials

1. No use without new tools and machines to develop new products
2. Better conditions for society

C. View chart on the development of tools

D. Students to bring in old tools for class to see

E. To obtain the greatest good for the greatest number of people, better and bigger tools must be invented and manufactured. We cannot produce more goods without better tools.

F. There is no solution to redistributing the same pie to feed more people. The pie must be made bigger or more pies produced.

Reference:

DoAll Corporation, Civilization Through Tools, Chart.

Title: General Safety in the Industrial Arts Laboratory

Presentation:

- I. Major causes of accidents
  - A. Carelessness and thoughtlessness
  - B. Not knowing how to do things
- II. Safety a habit
  - A. Become part of routine
  - B. Be recognized as important
  - C. Must be practiced
- III. Attitudes of safety
  - A. Safety is everyone's business
  - B. Always be careful
  - C. Follow the rules
  - D. Everyone try
  - E. Think
  - F. You are the key

References:

Carl Gerbracht and Frank E. Robinson, Understanding America's Industries, pp. 8-9.

UNIT EVALUATION:

Observe pupils as they work to determine if behavior has been affected.

TITLE OF UNIT

GAMES AND TOYS INDUSTRY

TEACHING TEAM

GARDNER SHERMAN  
HERALD KLIOWER  
KENNETH WASSON  
CHARLES FERDEN  
CHARLES PADDOCK

N D E A INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

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Department of Industrial Education and Technology

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## INTRODUCTION:

The manufacturing of games and toys has been growing at a tremendous rate. This rate of growth for the games and toys industry seems to come from technological advances... The American public continues to enjoy greater amounts of leisure time, thus enabling them to utilize more games and toys for recreational purposes. The growth of the games and toys industry is due in part to the desires and purchasing power of the American people.

With sales of approximately 1.48 billion dollars, the games and toys industry is a significant segment of the gross national product. The toy industry ranks 49<sup>th</sup> out of a total 61 leading industries. Economic prognosis indicates that population growth, personal income, and the increase of leisure time will continue to foster the expansion and growth of this segment of our economy.

With the ever-increasing emphasis on the space age, the toys and games industry introduced this era into its products, thus causing a totally new concept vivid to the imagination of the American public.

Youngsters and adults will always enjoy testing their skill through the use of individual and group games. A large variety of games and toys can be found on the counters and shelves of any department store.

These industries specialize in large-scale production of games and toys. Designers and manufacturers of games and toys capitalize on every factor that will attract the public. The products can be made from numerous types of materials, such as woods, plastics, metals, leathers, and paper. Design may vary from the very simple to the more complex mechanical.



The investigation of this type of industry is an ideal starting place in the continuing study of the manufacturing industries. Most pupils at this level will be highly interested in the production of an item. Through use of local, natural materials and pupil desires, it will be possible to develop basic understandings and appreciations concerning the games and toys industries.

SCOPE:

The games and toys unit is appropriate for junior high school students. The unit should follow a unit in custom production in which students have had previous background in industrial arts.

The product will be limited to a marketable item within the facilities of the laboratory, utilizing mass production methods and techniques. Because of limited time, and background of pupils, most of the jigs, fixtures, and machines for production work should be set up by the instructor.

~~SECRET~~  
OBJECTIVES:

1. To develop an understanding of the games and toys industry in our society.
2. To develop a degree of skill in the use of tools, machines and related processes in the games and toys industry.
3. To develop desirable attitudes toward work, the worker, and products of the games and toy industry.

OBJECTIVE 1: To develop an understanding of the games and toys industry in  
our society

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                             | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                      | TEACHER LESSONS                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <p>The students will be able to:</p> <ol style="list-style-type: none"> <li>1. Realize the importance of toys and games in the development of an individual</li> <li>2. Recognize the impact of the games and toys industries on our economy</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. Discuss the role or purpose of a game or toys for all age levels</li> <li>2. a. List area industries that manufacture toys and games</li> <li>b. Survey number and kinds of toys and games in own home</li> <li>c. Count the number of games and toys available to the public by looking in a catalog such as Sears or Wards</li> </ol> | <p>Toys and Games in Personal Development</p> <p>The Place of the Games and Toys Industry in our Economy</p> |
| <ol style="list-style-type: none"> <li>3. Compare different types of ownership</li> </ol>                                                                                                                                                               | <ol style="list-style-type: none"> <li>3. a. Form a company</li> <li>b. Buy stock in a company</li> </ol>                                                                                                                                                                                                                                                                                             | <p>Ownership of Industrial Enterprise</p>                                                                    |
| <ol style="list-style-type: none"> <li>4. Explain mass production as a manufacturing technique</li> </ol>                                                                                                                                               | <ol style="list-style-type: none"> <li>4. a. Observe film on mass production</li> <li>b. Research history and development of mass production</li> </ol>                                                                                                                                                                                                                                               | <p>Introduction to Mass Production</p>                                                                       |



**OBJECTIVE 2:** To develop skills in the use of tools, machines and related processes  
in the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                     | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                                    | TEACHER LESSONS                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <p>3. Make a working sketch or drawing</p> <p>4. Analyze working sketch for materials</p> <p>5. Analyze drawing for production processes</p> | <p>Have pupils:</p> <p>3. a. Prepare working sketch or drawing of selected product</p> <p>b. Examine an industrial drawing or print for general content or details</p> <p>4. a. Examine selected product for single and multiple parts</p> <p>b. Determine quantity of material needed</p> <p>c. Complete bill of materials needed</p> <p>5. a. Construct a diagram to illustrate the flow of material</p> <p>b. Make engineering process sheet for the product</p> | <p>Make a Working Sketch</p> <p>Analyze Sketches for Materials Required</p> <p>Process Engineering</p> |

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes  
in the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                   | PUPIL ACTIVITIES                                                                                                                                                        | TEACHER LESSONS               |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <p>The pupils will be able to:</p> <p>6. Procure material for the product</p> | <p>Have pupils:</p> <p>6. a. Examine stock racks for types and sizes of materials</p> <p>b. Inspect material for defects</p> <p>c. Get out stock with minimum waste</p> | <p>Selection of Stock</p>     |
| <p>7. Layout to finished sizes</p>                                            | <p>7. a. Apply finished dimensions to material and machine</p> <p>b. Apply templates or patterns to material</p>                                                        | <p>Using the Layout Tools</p> |
| <p>8. Cut finish sizes</p>                                                    | <p>8. a. Remove excess material with cutting tools and machines</p> <p>b. Check the quality of finished cuts</p>                                                        | <p>How Cutting Tools Work</p> |

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes  
in the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                  | PUPIL ACTIVITIES                                                                                                                                                                                  | TEACHER LESSONS                                                                                |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <p>9. Shape material to final details</p> | <p>Have pupils:</p> <p>9. a. Bore holes with and without jig guides</p> <p>b. Shape angles, bevels and chamfers</p> <p>c. File shapes and edges</p> <p>d. Make joints and grooves in material</p> | <p>How Cutting Tools Work</p>                                                                  |
| <p>10. Form to final shape</p>                                               | <p>10. a. Bend sheet metals to desired form</p>                                                                                                                                                   | <p>Using Jigs and Fixtures with Hand Tools and Machines</p> <p>Forming Tools and Equipment</p> |
| <p>11. Assemble manufactured parts</p>                                       | <p>11. a. Discuss methods of assembly</p> <p>b. Devise simple jigs to assemble parts</p> <p>c. Apply suitable fasteners to manufactured parts</p>                                                 | <p>How to Assemble Manufactured Parts</p>                                                      |



**OBJECTIVE 2: To develop skills in the use of tools, machines and related processes**  
in the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                            | PUPIL ACTIVITIES                                                                                                                                                           | TEACHER LESSONS                                      |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| <p>The pupils will be able to:</p> <p>12. Prepare surfaces for finishing materials</p> | <p>Have pupils:</p> <p>12. a. Inspect surface condition for a specified finish</p> <p>b. Condition surfaces for quality desired</p>                                        | <p>Surface Preparation for Finishing</p>             |
| <p>13. Select and apply finishing materials</p>                                        | <p>13. a. Experiment to find a suitable finishing material to protect and decorate the product</p> <p>b. Apply finishing material by a method suitable for the product</p> | <p>Available Finishes and Methods of Application</p> |
| <p>14. Inspect or test the finished product</p>                                        | <p>14. a. Compare finished product to the sketches and prepared drawing</p> <p>b. Inspect the quality of the finish</p> <p>c. Test moveable parts for proper operation</p> | <p>Inspection Methods</p>                            |

OBJECTIVE 2: To develop skills in the use of tools, machines and related processes  
in the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                        | PUPIL ACTIVITIES                                                                                                                                        | TEACHER LESSONS            |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <p>The pupils will be able to:</p> <p>15. Prepare the product for distribution</p> | <p>Have pupils:</p> <p>15. a. Package the product for protection</p> <p>b. Package the product to sell</p> <p>c. Attach company label and guarantee</p> | <p>Packaging a Product</p> |

**OBJECTIVE 3:** To develop desirable attitudes toward work, the worker, and products of the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                                                                                                                                                                                                                                                       | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                                               | TEACHER LESSONS                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <ol style="list-style-type: none"> <li>1. Recognize quality in products of the games and toys industry</li> <li>2. Describe the organization and working conditions of a manufacturing industry</li> <li>3. Accept responsibility commensurate to his assigned post</li> </ol> | <p>Have pupils:</p> <ol style="list-style-type: none"> <li>1. a. Compare well-made products with inferior ones</li> <li>    b. Criticize industrial products for consumer value</li> <li>    c. Perform inspection of parts</li> <li>2. a. Set up work stations</li> <li>    b. List job descriptions</li> <li>    c. Visit a manufacturing industry</li> <li>d. Fill out industrial observation sheet</li> <li>3. a. Draw up production flow chart</li> </ol> | <p>Evaluating Products</p> <p>Industrial Company Organization</p> <p>Industrial Personnel and their Responsibilities</p> |

**OBJECTIVE 3:** To develop desirable attitudes toward work, the worker, and products of the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                                                      | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                                                                                                                                                               | TEACHER LESSONS            |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <p>The pupils will be able to:</p> <p>4. Recognize the role of organized labor and how it affects the worker</p> | <p>Have pupils:</p> <p>3. b. Participate in the production line of the industry</p> <p>c. Participate in maintenance clean-up</p> <p>d. Explain particular responsibilities in company organization</p> <p>4. a. Report on conditions that can be improved in the Industrial Arts facility</p> <p>b. Make comparison of early industrial conditions to the present</p> <p>c. Fill out job application</p> <p>d. Set up grievance committee</p> | <p>Labor Organizations</p> |

OBJECTIVE 3: To develop desirable attitudes toward work, the worker, and products of the games and toys industry

| EXPECTED BEHAVIORAL CHANGES                                                                                      | PUPIL ACTIVITIES                                                                                                                                                                                                                                                                                  | TEACHER LESSONS                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>The pupils will be able to:</p> <p>5. Realize the importance of <u>individual</u> and <u>group safety</u></p> | <p>Have pupils:</p> <p>4. e. Report on different types of laboratory organizations</p> <p>5. a. Participate in safety campaign in the laboratory</p> <p>b. Make posters and slogans on safety</p> <p>c. Wear safety equipment</p> <p>d. Observe safety instructions for individual operations</p> | <p><u>Safety in the Industrial Arts Laboratory</u><br/>(Specific safety instruction included in each lesson where applicable)</p> |

**APPROACH:**

Pupils will compare a custom and a mass produced product by observation of the product. A film will be presented, introducing the operation of a factory.

Pupils will define the terms, games and toys, and present to the class sketches of ideas that they have designed for possible production.

Final product selection will be determined on the basis of appeal to the general public, potential of sales on the market, and limitations of the laboratory facilities.

RESOURCE MATERIALS:

A. REFERENCE AND RESEARCH MATERIALS:

Amrine, Harold T; Ritchey, John A., and Hulley, Oliver S., Manufacturing Organization and Management, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1966.

Association of Consulting Management Engineers, Inc., Common Body of Knowledge for Management Consultants, The Association, New York, 1957.

Bethel, Lawrence L.; Atwater, Franklin S.; Smith, George H. E.; Stackman, Harvey A., Industrial Organization and Management, McGraw-Hill Book Company, 1962.

Boyd, T. Gardner, Metalworking, Goodheart-Willcox, Homewood, Illinois, 1962.

Cain, Ethel and Hunt, Sarah Ethridge, Games the World Around, A. S. Barnes and Company, New York, 1941.

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Cook, Donald E., Marvels of American Industries, C. S. Hammond and Company, Maplewood, New Jersey, 1962.

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\_\_\_\_\_, Industrial Arts Woodworking, Charles A. Bennett Company, Inc., 1960.

\_\_\_\_\_, Woodworking for Industry, Charles A. Bennett Company, Inc., Peoria, Illinois, 1963.

French, Thomas E. and Carl L. Svensen, Mechanical Drawing, McGraw Hill Book Company, Inc., 1940.

Gerbracht, Carl; Robinson, Frank; and Hanks, William, Understanding America's Industries, McKnight and McKnight, Bloomington, Illinois, 1962.

Haws, Robert J. and Schaefer, Carl J., Manufacturing in the School Shop, American Technical Society, Chicago, Illinois, 1960.

Kettering, Charles Franklin; Orth, Allen, American Battle for Abundance, General Motors, Detroit, Michigan, 1962.

Klok, John, Wood Production and Engineering, Klok Institute, Grand Rapids, Michigan, 1949.

Ludwig, Oswald A., Metalwork Technology and Practice, McKnight and McKnight Publishing Company, Bloomington, Illinois, 1947.

Olson, Delmar W., Industrial Arts for the General Shop,  
Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1955.

\_\_\_\_\_, Woods and Woodworking for I. A., Prentice-  
Hall, Inc., Englewood Cliffs, N. J., 1965.

Smith, Lavon B. and Maddox, Marion E., Elements of American  
Industry, McKnight and McKnight Publishing Company,  
Bloomington, Illinois, 1966.

Wagner, Willis H., Woodworking, Goodheart-Willcox, Homewood,  
Illinois, 1961.

Walker, John R., Modern Metalworking, Goodheart-Willcox,  
Homewood, Illinois, 1965.

Wilber, Gordon and Norman Pendered, Industrial Arts in  
General Education, International Textbook Company,  
Scranton, Pennsylvania, 1968.



RESOURCE MATERIALS:

B. TEACHING AIDS AND DEVICES

1. Films

- a. The Factory, How a Product is Made, #11684, University of Michigan Audio Visual Education Center, 720 E. Huron Street, Ann Arbor, Michigan. Cost: \$6.50
- b. Technology and You, Audic-Visual Center, Bloomington, Indiana, \$1.75 rental

2. Teaching aids

- a. Stock certificate
- b. Transparency - elements of design
- c. Information sheet - classified ads
- d. Job application form
- e. Corporate organization
- f. Cash flow chart
- g. Time card
- h. Assembly line flow chart
- i. Bill of material
- j. Job ticket
- k. Pictorial of product
- l. Assembly drawing
- m. Detail drawing of board
- n. Detail drawing of leg
- o. Stretch out of box
- p. Packaging label




# ELEMENTS OF DESIGN

## LINES

  
**STRAIGHT**

  
**CURVED**

  
**CIRCULAR**

## SHAPE



## MASS

## PROPORTION

**GOLDEN RULE (1.618)**

**ODD RATIOS**

**MOST APPEALING**

**RECTANGLES**

**OVALS**

**FREE FORMS**

## BALANCE

**FORMAL**

**NON-FORMAL**

## COLOR

## TEXTURE

# CLASSIFIED ADVERTISING

-----THE FOLLOWING JOBS AVAILABLE TO QUALIFIED PEOPLE IN NEWLY ORGANIZED GAMES AND TOYS INDUSTRY.

## PLANT MANAGER

Responsible for the organization and management of plant. (Must be industrious and hard working)

## V. P. FOR FINANCE

Responsible for the organization of the financial aspects of company. Primary concern will be determining material costs. (Must enjoy math)

## **ENGINEERING MANAGER**

Major responsibility for the engineering of products from idea through production planning.

## **PRODUCT MANAGER**

Responsible for the setting up of production, making product parts, assembly, and quality control of product.

## **PERSONNEL MANAGER**

Responsible for the safety in the plant and for hiring of personnel.

## **VICE PRESIDENT MARKETING**

Responsible for the advertising and selling of the manufactured product.

(JOB APPLICATIONS MAY BE OBTAINED FROM YOUR INSTRUCTORS)

IRISHWOOD, INCORPORATED

APPLICATION FOR EMPLOYMENT

Title of the job you are applying for \_\_\_\_\_

Print your name in full \_\_\_\_\_  
(Last) (First) (Middle)

Qualifications \_\_\_\_\_

Reason for applying for this position \_\_\_\_\_  
(Use back of sheet if necessary)

Street Address \_\_\_\_\_ Nearest telephone \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ S. S. Number \_\_\_\_\_

How long at this address \_\_\_\_\_ Wages expected \$ \_\_\_\_\_

Age \_\_\_\_\_ Date of birth \_\_\_\_\_ Height \_\_\_\_\_  
Month Day Year Feet Inches

Weight \_\_\_\_\_ Sex \_\_\_\_\_ Hobbies \_\_\_\_\_

Sports interested in \_\_\_\_\_

Do you have any physical defects? \_\_\_\_\_

If so, what are they? \_\_\_\_\_

How many days have you lost by illness in the past 2 years? \_\_\_\_\_

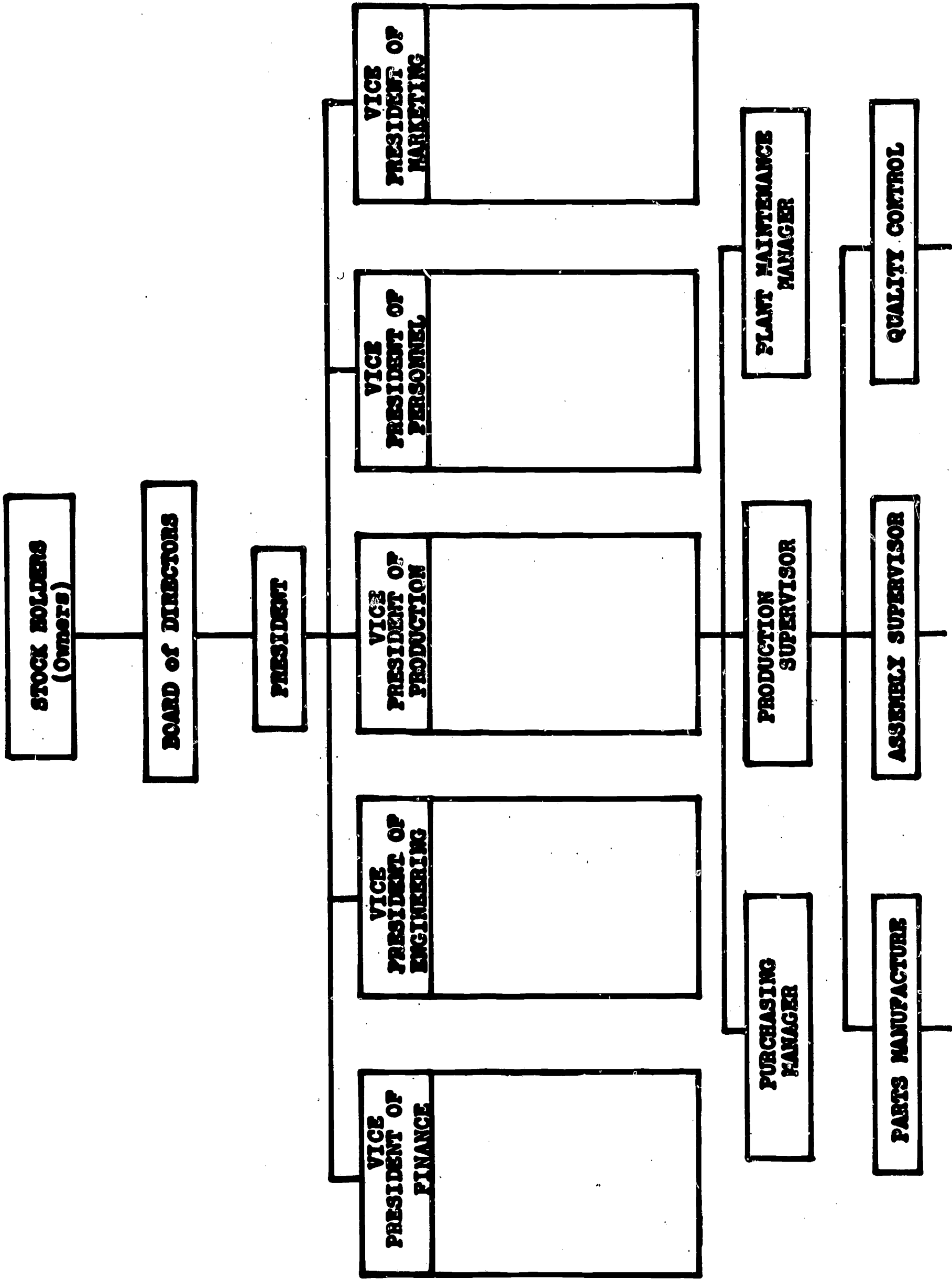
Were you ever employed by this company before? \_\_\_\_\_

List some names of friends or relatives working here \_\_\_\_\_

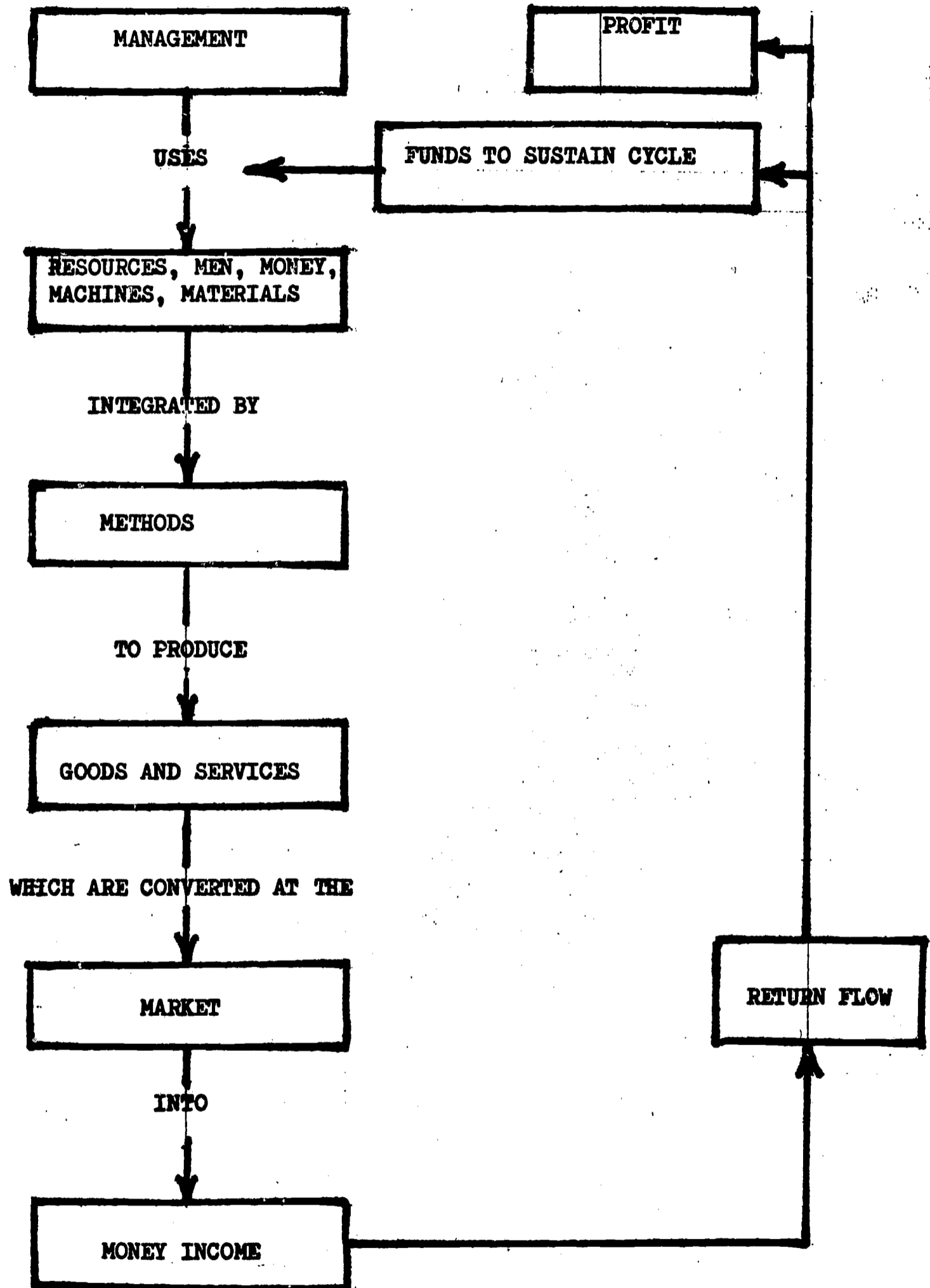
| Education                           | Name of School | Location | Yrs. Attended | Years Comp. |
|-------------------------------------|----------------|----------|---------------|-------------|
| Grammar School                      | _____          | _____    | _____         | _____       |
| High School                         | _____          | _____    | _____         | _____       |
| Other education or special training | _____          | _____    | _____         | _____       |

I declare and warrant that the answers made herein are correct and true and I am willing to undergo examination and to be fingerprinted.

(Date) \_\_\_\_\_ (Signed) \_\_\_\_\_



# CASH FLOW CHART



NAME \_\_\_\_\_

STUDENT NUMBER \_\_\_\_\_

| TIME CARD | HR. | MIN. | DATE |  | TIME |  |
|-----------|-----|------|------|--|------|--|
|           |     |      |      |  | IN   |  |
|           |     |      |      |  | OUT  |  |
|           |     |      |      |  | IN   |  |
|           |     |      |      |  | OUT  |  |
|           |     |      |      |  | IN   |  |
|           |     |      |      |  | OUT  |  |
|           |     |      |      |  | IN   |  |
|           |     |      |      |  | OUT  |  |
|           |     |      |      |  | IN   |  |

\_\_\_\_\_  
TOTAL HOURS

WEEK ENDING \_\_\_\_\_

NDEA INSTITUTE

1968

PRACTICUM

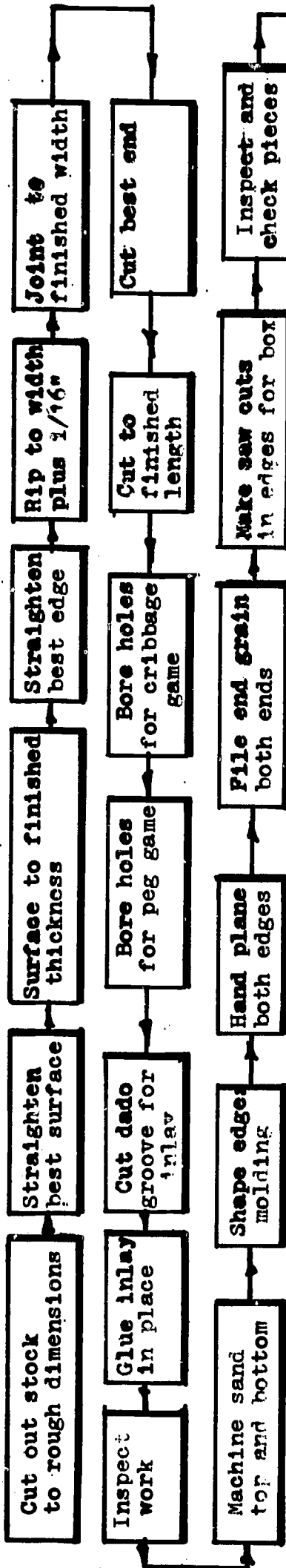
GORHAM STATE COLLEGE

GORHAM, MAINE



FLOW DIAGRAM

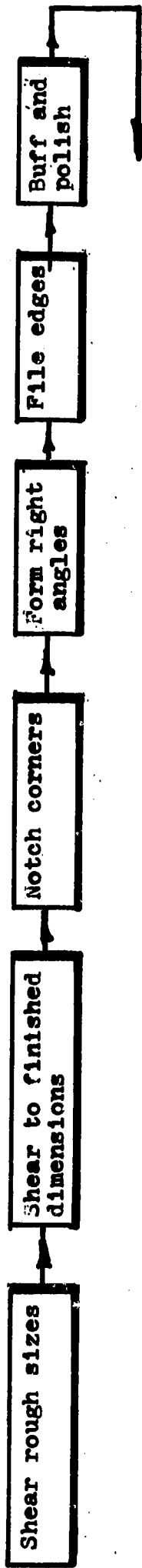
BASE



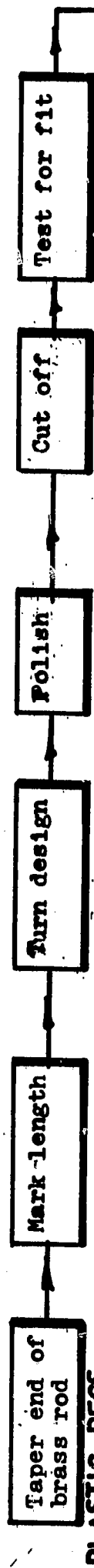
LEG



BOX



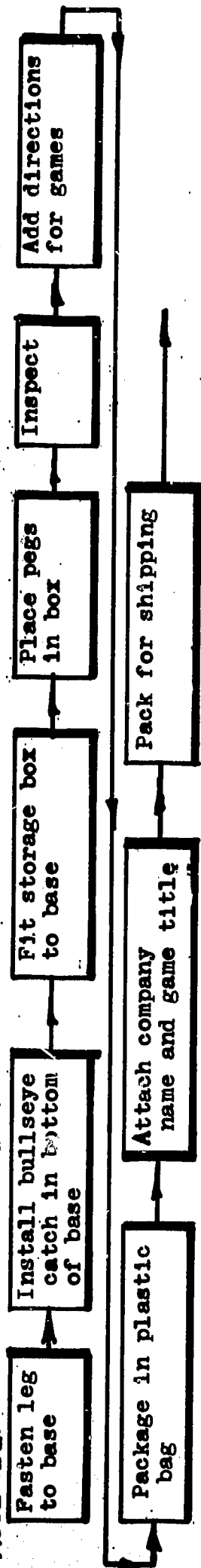
BRASS PEGS



PLASTIC PEGS

Cut manufactured plastic pegs to length  
Use hair curler picks

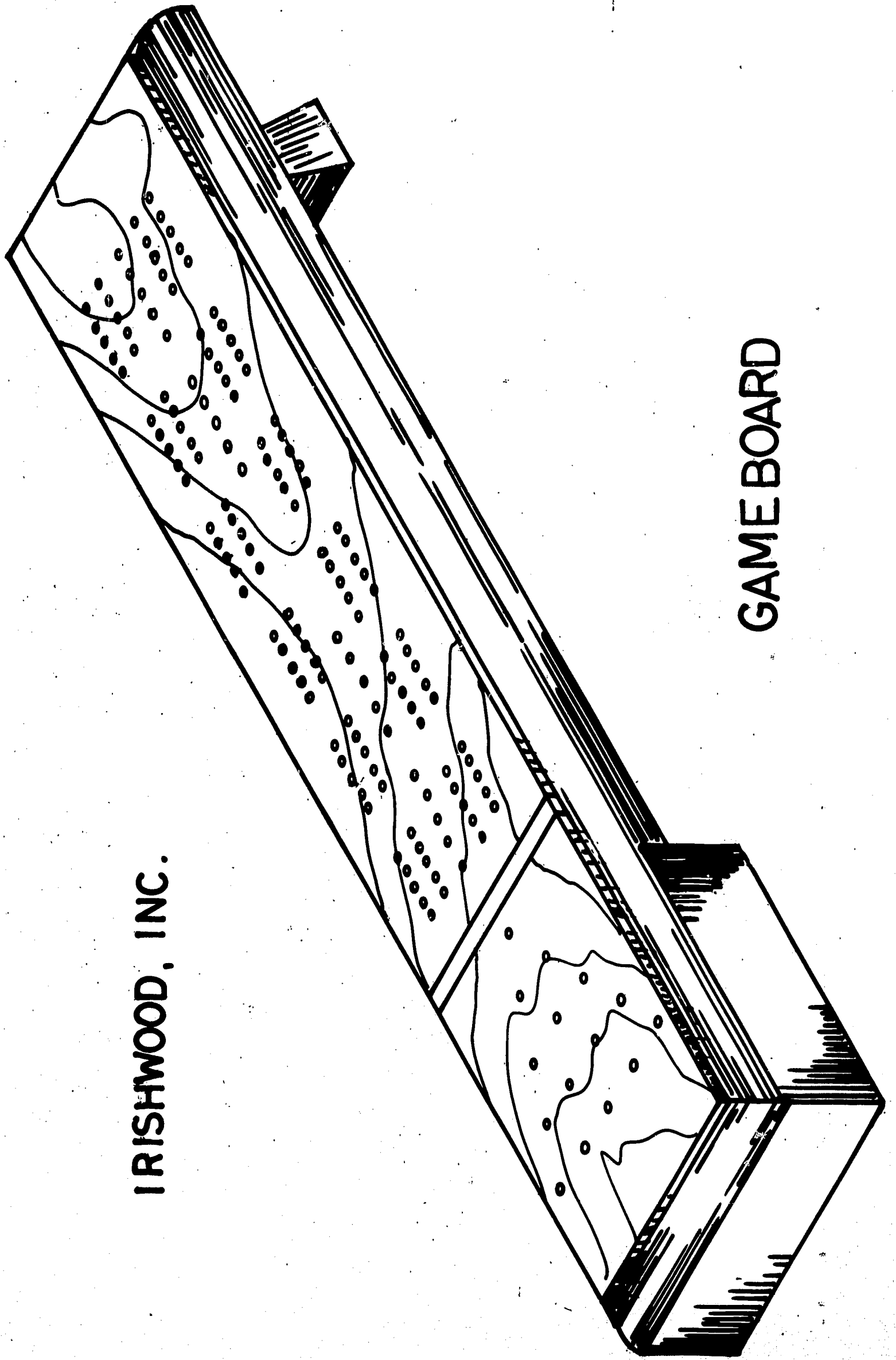
ASSEMBLY



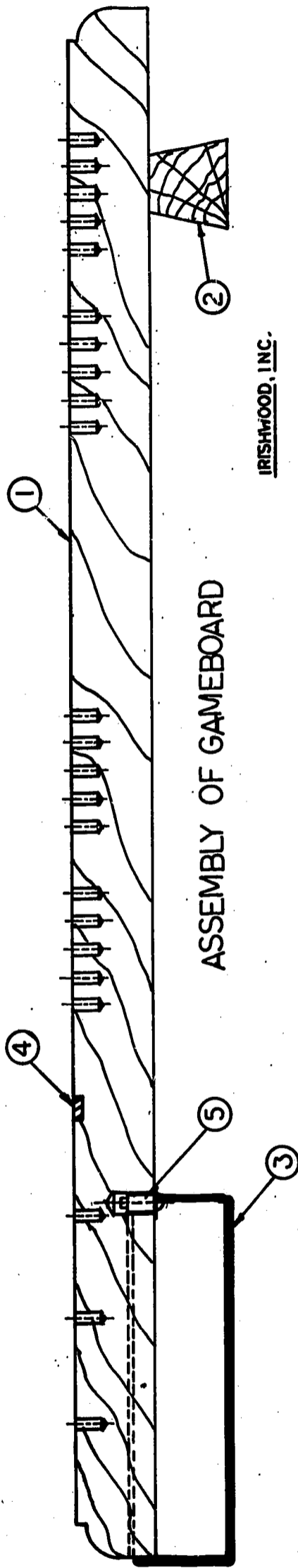
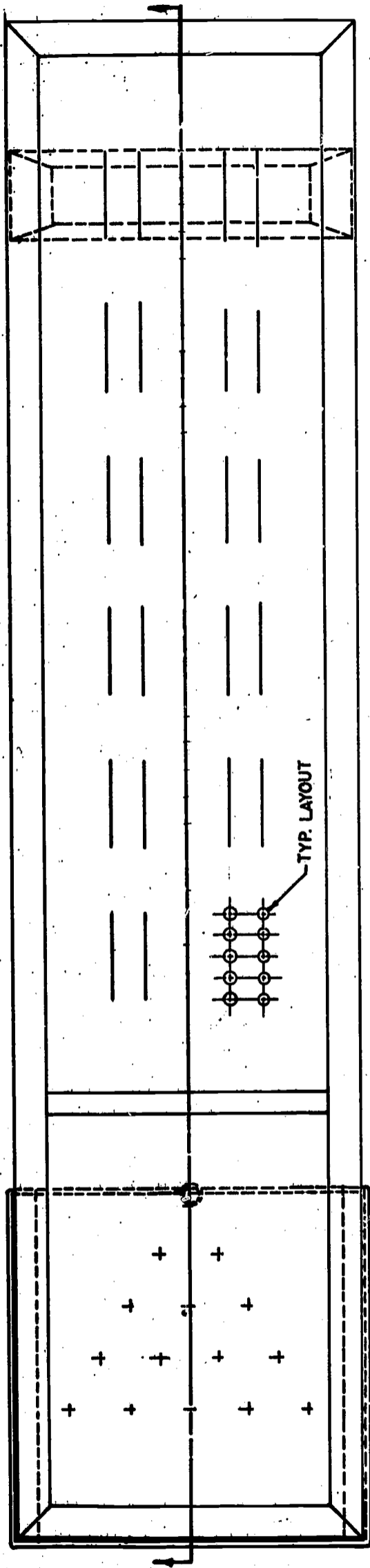




IRISHWOOD, INC.



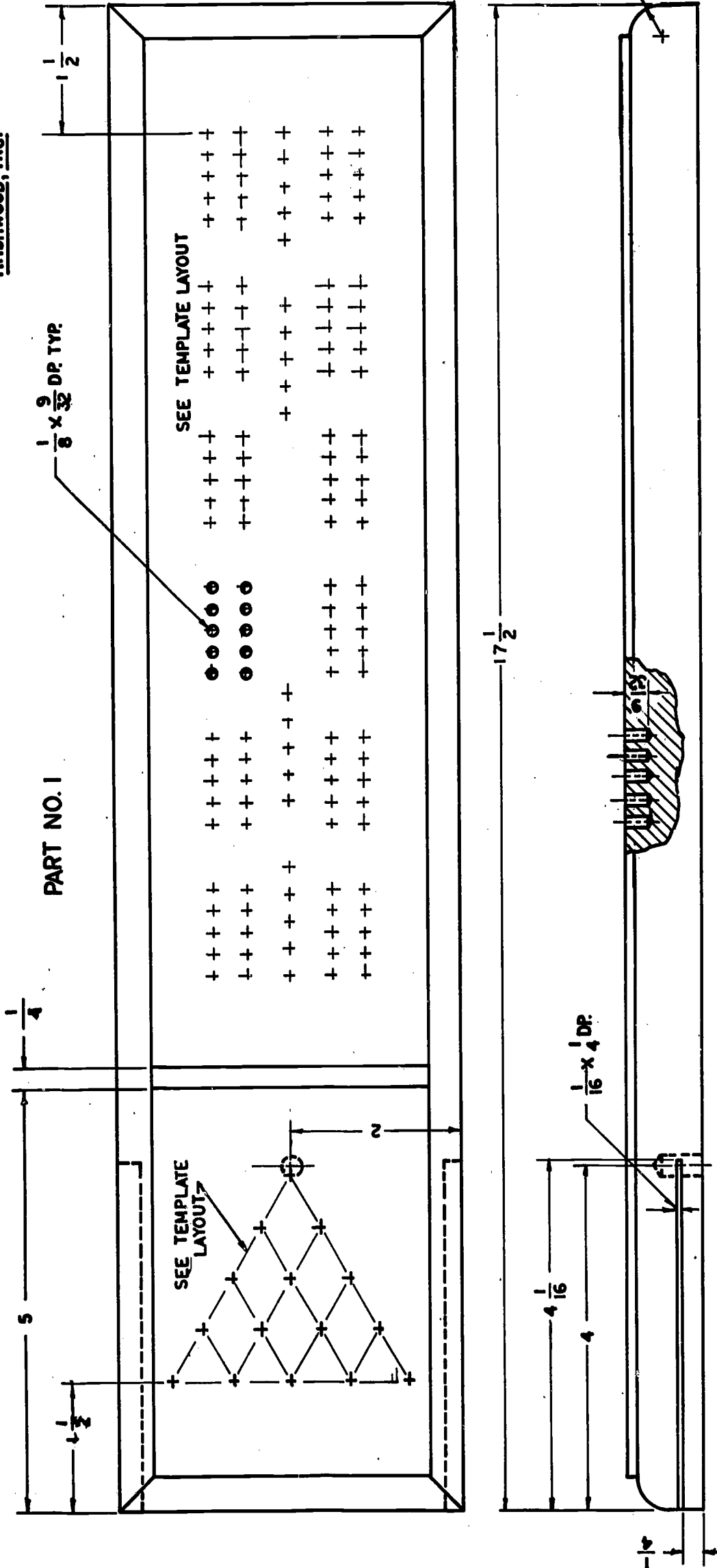
GAME BOARD



ASSEMBLY OF GAMEBOARD

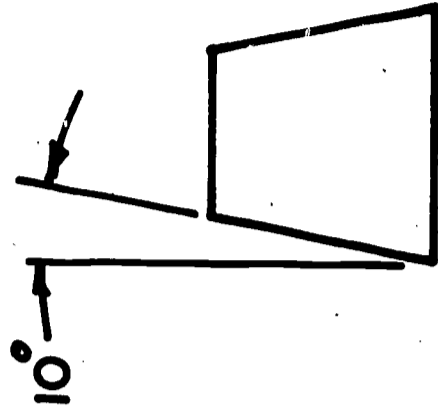
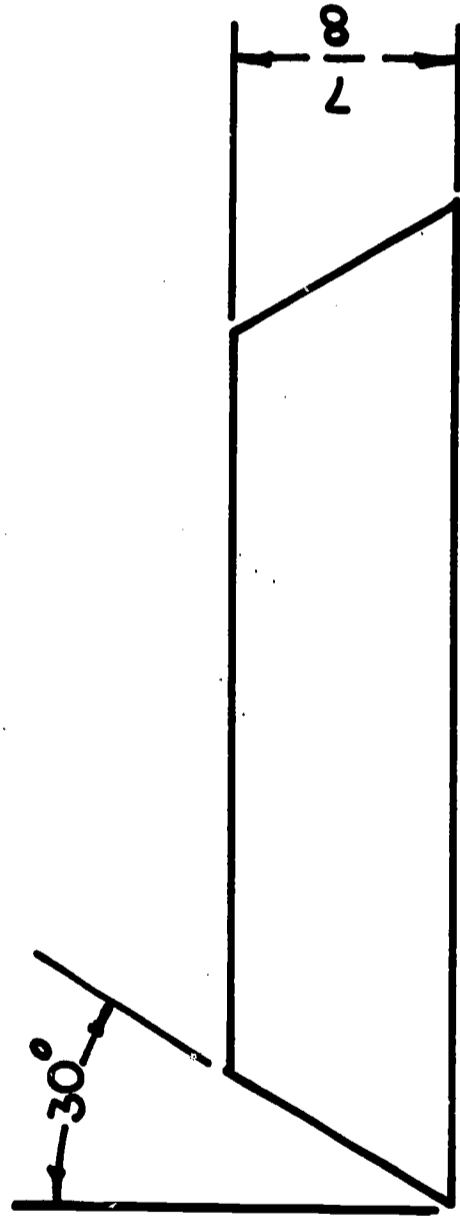
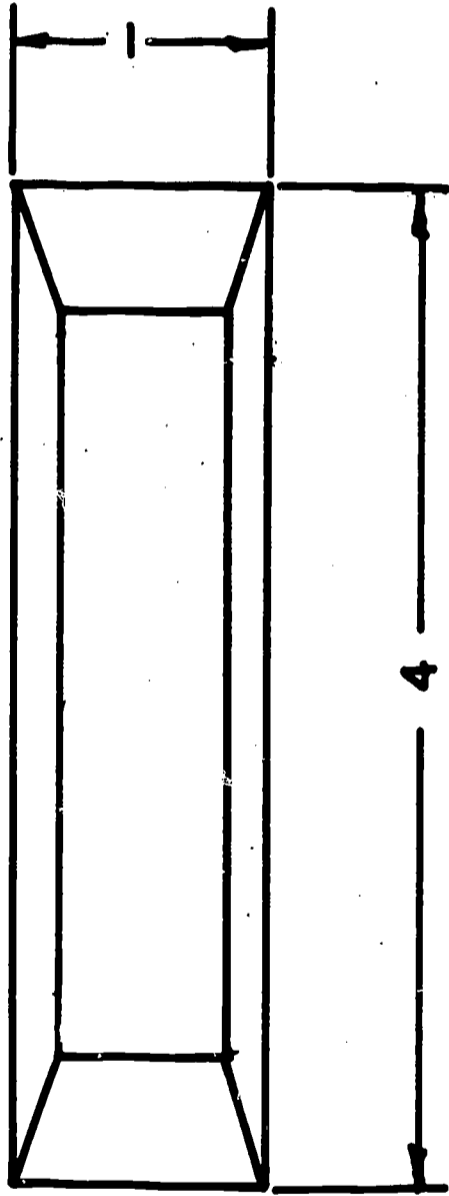
IRISHWOOD, INC.

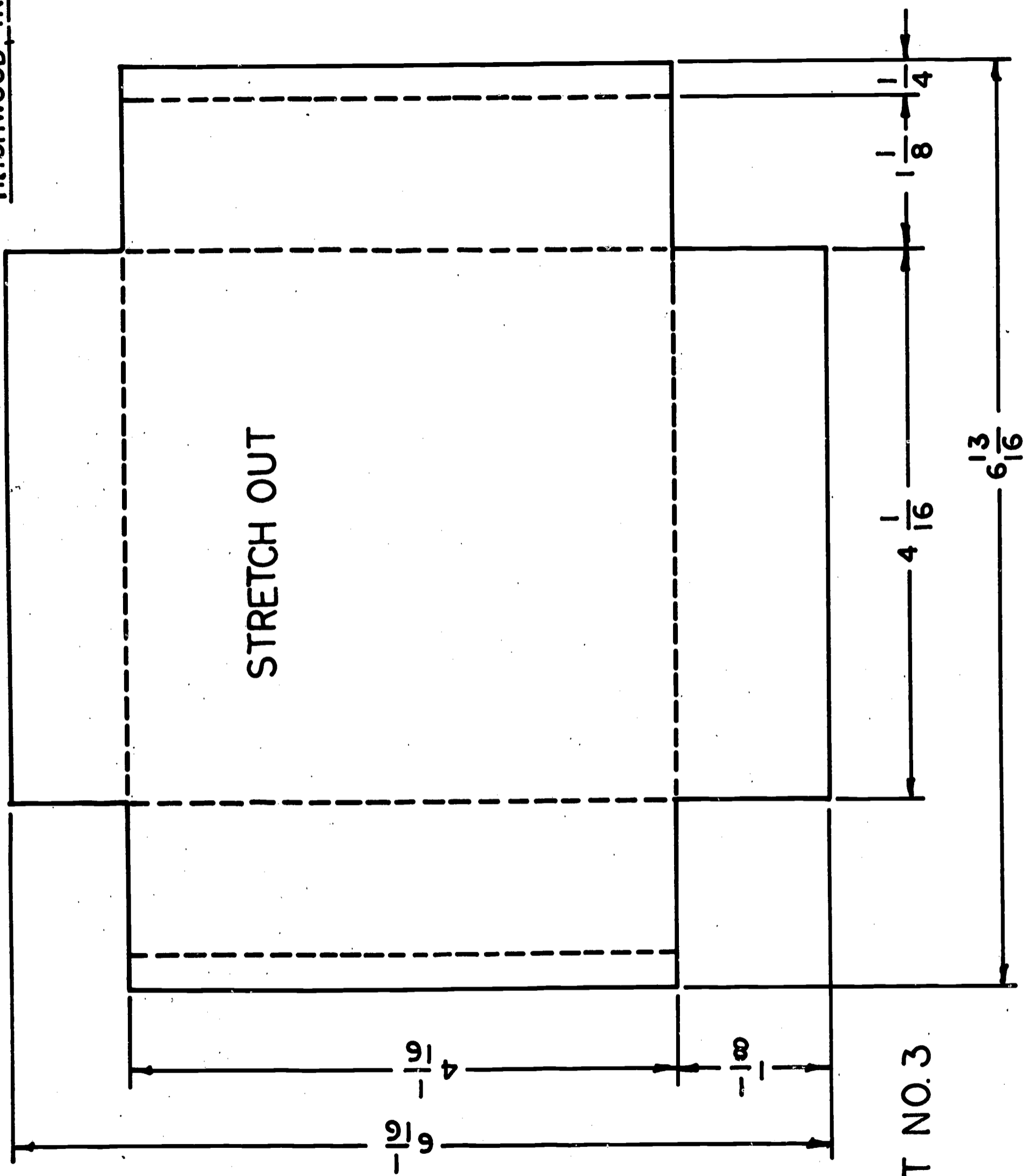
IRISHWOOD, INC.



IRISHWOOD, INC.

PART NO. 2





PART NO. 3



Play Cribbage!      O Play the new Peg Game!

Mahogany Cribbage Board  
and  
Peg Game Set

Irishwood Inc.      1968

TOOLS AND EQUIPMENT:

No special tools or machines are necessary beyond the usual equipment of an industrial arts laboratory.

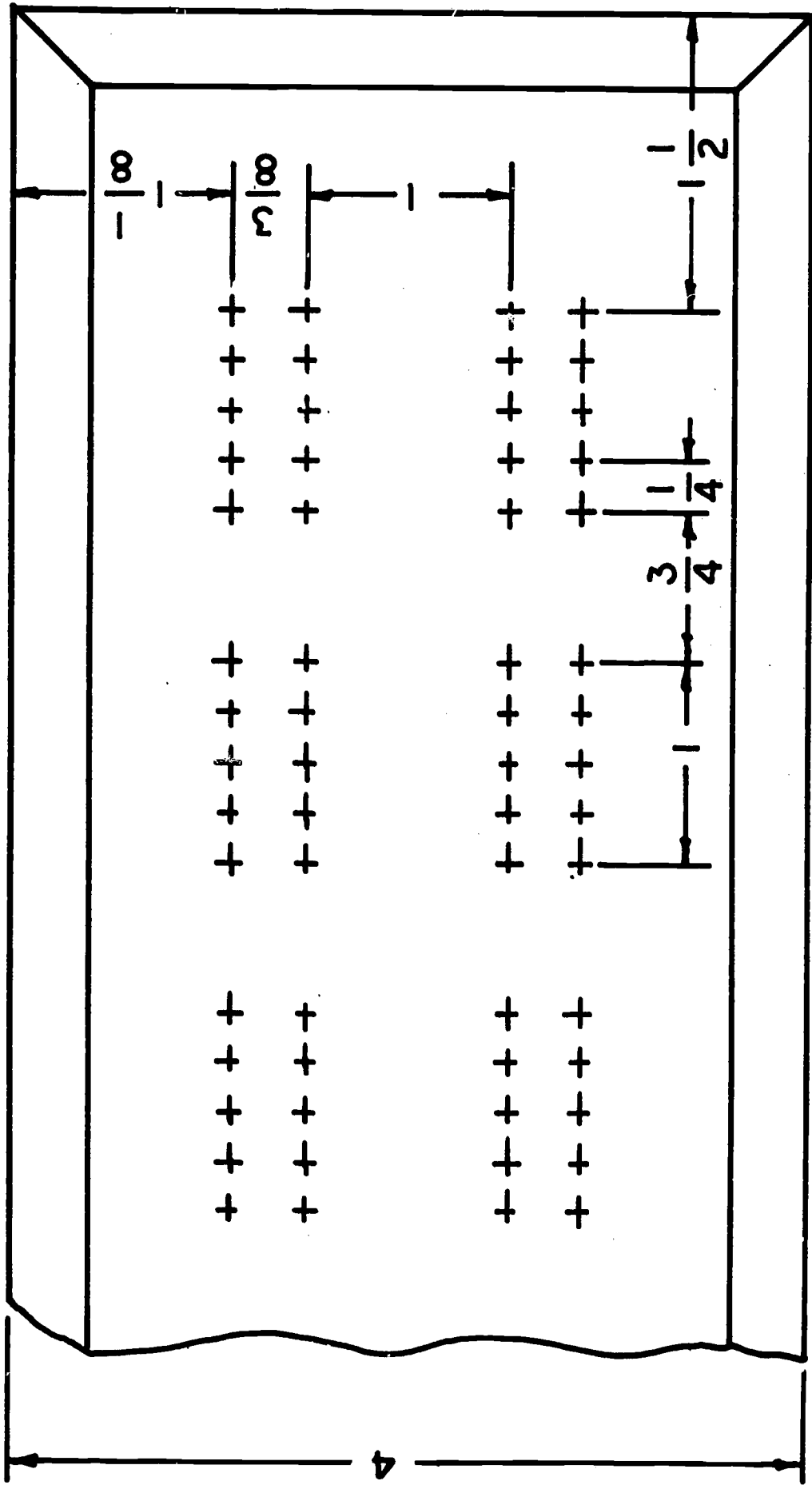
MATERIALS AND SUPPLIES:

1. Mahogany lumber
2. Maple lumber
3. Aluminum punched sheet stock
4. Brass brazing rod - 1/8" diameter
5. Molded plastic pegs
6. Wire brads - 1 1/4" - #16
7. Glue (white)
8. Bulls eye catch - 1/4" diameter
9. Penetrating wood sealer
10. Steel wool
11. Garnet finishing paper
12. Aluminum oxide machine belts (abrasive)

JIGS AND FIXTURES:

1. Hole template for cribbage board
2. Hole template for peg game
3. Jig for placing hole in bottom of board
  - a. Mark and bore
  - b. Place jig on table of drill press - for bullet catch
4. Jig for boring holes in leg
5. Stop blocks used on circular saw fence
6. Jig for assembling leg

IRISHWOOD, INC.



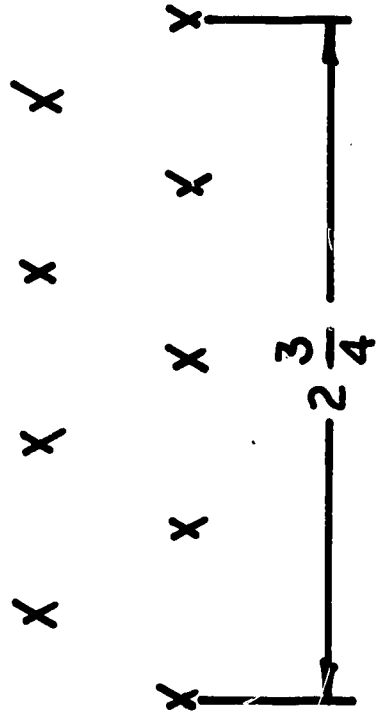
LAYOUT FOR THE CRIBBAGE GAME ON PART NO. 1

ONE HALF PLAN

IRISHWOOD, INC.

X  
X X  
X X X  
X X X X  
X X X X X

EQUILATERAL TRIANGLE  
EACH SIDE TO BE DIVIDED  
INTO 5 EQUAL PARTS

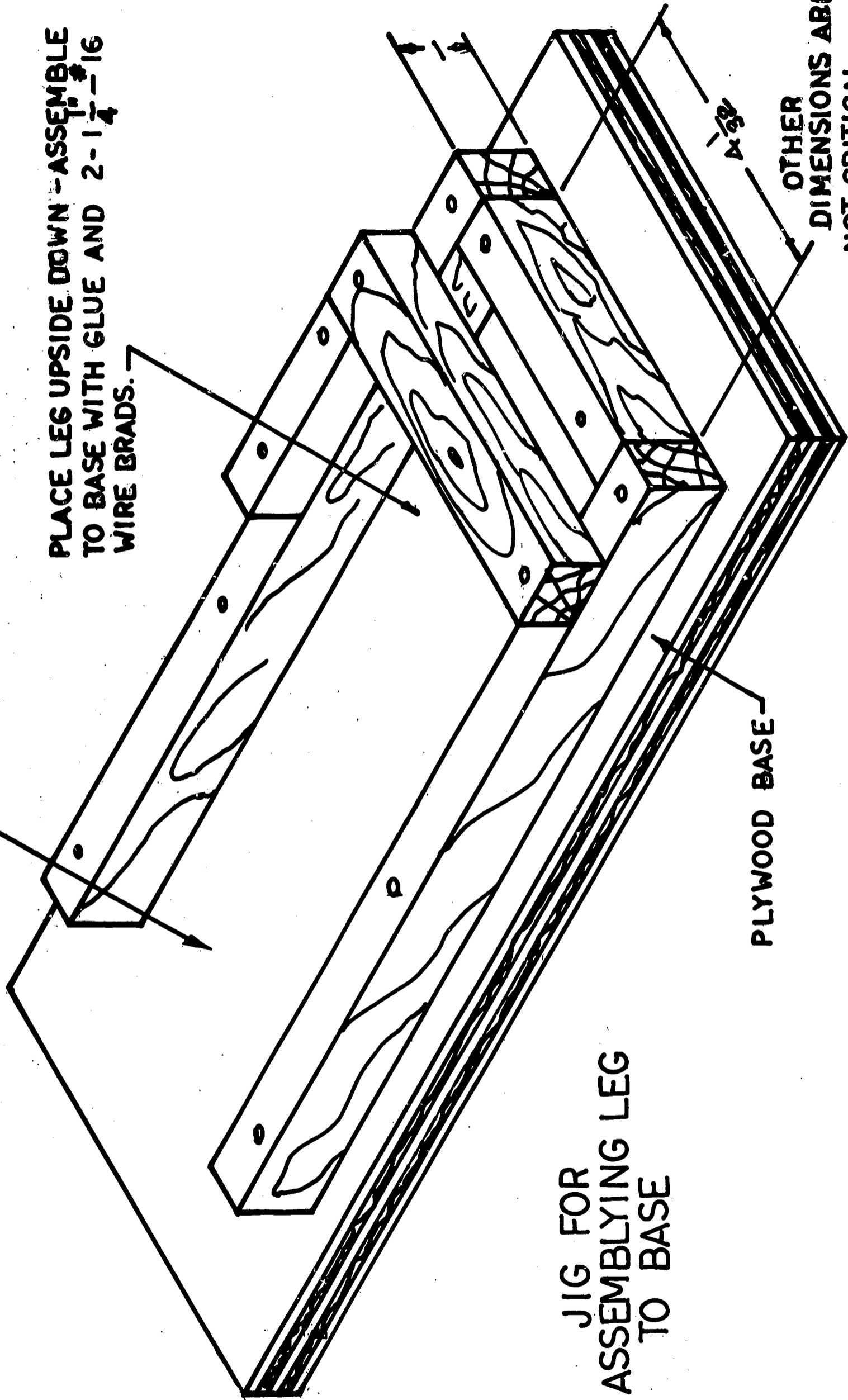


LAYOUT FOR THE PEG GAME ON PART NO. I

IRISHWOOD, INC.

PLACE BASE UPSIDE DOWN HERE  
CRIBBAGE BOARD END INTO JIG

PLACE LEG UPSIDE DOWN - ASSEMBLE  
TO BASE WITH GLUE AND  $2-1\frac{1}{4}$ " #16  
WIRE BRADS.



JIG FOR  
ASSEMBLYING LEG  
TO BASE

PLYWOOD BASE

OTHER  
DIMENSIONS ARE  
NOT CRITICAL

LESSONS TO BE TAUGHT:

Toys and Games in Personal Development and Economy

Ownership of Industrial Enterprise

Introduction to Mass Production

Elements of Design

Selecting a Product to Manufacture

Make a Working Sketch

Analyze Sketches for Materials Required

Process Engineering

Selection of Stock

Using the Layout Tools

How Cutting Tools Work

Use of Jigs and Fixtures

Forming Tools and Equipment

How to Assembly Manufactured Parts

Surface Preparation for Finishing

Available Finishes and Methods of Application

Inspection Methods

Packaging a Product

Evaluating Products

Industrial Organization

Industrial Personnel and their Responsibilities

Labor Organizations

Safety in the Industrial Arts Laboratory

Review Lesson on Manufacturing - The Seven M's of Manufacturing ...

Title: Toys and Games in Personal Development and Economy

Presentation:

I. Play, a heritage from ancient man

A. Simple forms of playthings

1. Nuts from trees
2. Sticks
3. Shells
4. Multi-colored rocks

B. Contributed to his development

1. Observing
2. Reasoning
3. Learning

II. Experimentation with his own mechanism

A. Tested his skill and strength

B. Matched it with that of his associates

1. Ran races
2. Wrestled
3. Engaged in various types of contests

III. Child's understanding develops slowly

A. Promoting a new concept of human relationships

1. Self-control
2. Assume responsibility
3. Promote fair play
4. Reveal good sportsmanship

B. Developing appreciation of other people

1. Nations do similar things
2. Have similar problems
3. Success of nations
  - a. Inventions
  - b. Discoveries

C. The balance of personality

1. Be able to live with himself
2. Less dependent on other resources
3. Make his own work or play

D. Integrating the individual and society

1. Develop agility to adjust to varied situations
2. Directing behavior toward good of a group



IV. Role in our economy

A. 1962 - \$908,000 value of goods produced

B. 1964 - \$1,000,000 value of goods produced

C. Ranks 49<sup>th</sup> out of 61 leading industries

References:

Sarah Ethridge Hunt and Ethel Cain, Games the World Around,  
pp. 2, 10-14

"Games and Sports," Lincoln Library of Essential Information,  
p. 2089

Title: Ownership of Industrial Enterprises

Presentation:

I. What is ownership?

A. A legal term

B. Commonly means legal title to:

1. A thing
2. Right of possession
3. Control and disposal

C. Applied to industry, it means:

1. Title to possession of
  - a. Assets
  - b. Power to determine policies of operation
  - c. Right to receive and dispose of proceeds

II. Common types of ownership

A. Individual ownership

1. Serves customer
2. Decides policy
3. Manages business
4. Personal capital and loan finance business
5. Liable for all entire business
6. Lends itself to small business

B. Partnership

1. Serves customer
2. Partners agree on policy
3. One or both partners manage
4. Partners own business equally
5. Both equally liable
6. Also lends itself to smaller businesses

C. Corporation

1. Dominates the manufacturing field
2. Legally created business
  - a. Owners are stockholders
  - b. Board of directors fix policies
  - c. Top ranking officials chosen by directors to manage company

References:

Lawrence L. Bethel, Franklin Atwater, George Smith, Harvey Stackman, Jr., Industrial Organization and Management, pp. 11-14

Title: Introduction to Mass Production

Presentation:

- I. Definition of mass production
  - A. Manufacturing products with many parts in large quantities
- II. Significant contributors to mass production
  - A. Eli Whitney
    1. Interchangeable parts
  - B. Henry Ford
    1. First mass production factory as we know it today
    2. Originated the first moving assembly line
- III. Use in manufacturing as a major manufacturing method
  - A. Parts production
    1. Standard interchangeable parts
  - B. Assembly of products
    1. Rapidly
    2. Accurately
- IV. Effects on society
  - A. More leisure time
  - B. Good quality products
  - C. Lower cost per unit
  - D. Higher wages for worker

References:

Charles Franklin Kettering and Allen Orth, American Battle for Abundance.

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 209-236.

Title: Elements of Design

Presentation:

I. Lines

- A. Straight
- B. Curved
- C. Circular

II. Shape

- A. Squares
- B. Rectangles
- C. Triangles
- D. Round

III. Mass

IV. Proportion

- A. Golden rule (1.618)
- B. Odd ratios are more appealing than even ratios
- C. Most appealing
  - 1. Rectangles
  - 2. Ovals
  - 3. Free forms

V. Balance

- A. Formal
- B. Non-formal

VI. Color

- A. One color should be dominant
- B. Warm colors
  - 1. Red
  - 2. Orange
  - 3. Yellow

C. Cool colors

1. Blue
2. Purple
3. Green

VII. Texture

A. Condition of the surface of the metal

B. Can be added by

1. Perforating
2. Cutting
3. Pressing
4. Rolling
5. Expanding

References:

- T. Gardner Boyd, Metalworking, pp. 7-9

Title: Selecting a Product to Manufacture

Presentation:

I. Criteria for selecting a product

A. Commercial value in marketing

1. Quality product will sell itself
2. How many will sell?
3. Need for the product
4. Produce a profit to the company
  - a. Desirable to most pupils
  - b. Reasonable selling price

B. Design of the product

1. Functional value
  - a. Durability
  - b. Serve intended purpose
  - c. Mechanically sound
2. Decorative value
  - a. Beauty - attractive
  - b. Personality - different
  - c. Uses proper elements of design
3. Economy of material

C. Limitations

1. Size of product
  - a. Too small - not worth profits
  - b. Too large
    - 1) Too many processes
    - 2) More help needed
  - c. Storage problems
  - d. Distribution problems
    - 1) Packaging
    - 2) Cost of transportation
2. Facilities
  - a. Available tools and equipment
  - b. Production flow
  - c. Storage of materials
3. Manpower
4. Time necessary for manufacture
  - a. Engineering time
  - b. Production time
  - c. Marketing time

II. Collection of ideas for a product

A. Brain storm as a group

1. Involve pupil ideas
2. Record ideas on paper or tape
3. Evaluate ideas

**B. Assign outside assignment to bring in ideas for a product**

1. Pictures and catalogs
2. Models and samples
3. Sketches or drawings
4. Books and magazines
5. Gift lists
6. Visit local stores

**C. Company research and development department announce suggestion for a new product**

1. Redesign of existing product
  - a. Lower production time
  - b. Better design - functional, saleable
  - c. Produced at lower cost
2. Product designed to use a newly developed material
3. Development of an original idea

**D. Demonstrate a need for a product by reminding pupils of underprivileged people**

1. Christmas gifts
2. Recreational gifts

**III. Methods of selecting a product idea**

**A. Board of Directors elect**

**B. Pupils acting as salesmen present their ideas to the company**

**C. Teacher assists as a consultant to the company**

1. Suggest combining ideas of products
2. Refine usable ideas

**D. Pupils elect by popular vote**

1. Choose 3 in order - First, Second, and Third
2. Give prize or bonus for first choice of idea
3. Elect one product to be manufactured.

**References:**

Delmar W. Olson, Industrial Arts for the General Shop, pp. 34-39

Title: Make a Working Sketch

Presentation:

I. Define a sketch or preliminary drawing

A. Graphic communication of ideas

1. Sketches understood in most any country
2. Alphabet of 6 lines used compared to 26 letters and complicated grammar in English

B. Examine a prepared working drawing for details and necessary information

C. Sketches or preliminary drawings used in industry are called layouts

1. Skilled draftsmen and technicians make final drawings
2. Sketches can be used in place of final drawings

II. Equipment needed

A. Media

1. Graph paper, tracing paper, drawing paper

B. Tools

1. T-square, scale, triangles, compass, templates
2. Soft and hard pencils, tape, working surface

III. Steps in making free hand or drawing a sketch

A. Observe the object

1. Select necessary views to describe

- a. Oblique
- b. Isometric
- c. Orthographic

- 1) Two or three views
- 2) Section
- 3) Auxiliary
- 4) Pattern

2. Judge proportions

3. Block in enclosing rectangles with light lines

- a. Spacing between views
- b. Scale

4. Locate and block in details with light lines

5. Thicken and darken desired lines

6. Apply dimensions and notes



References:

Thomas E. Franch and Carl L. Svensen, Mechanical Drawing,  
pp. 33-34

Title: Analyze Sketches for Material Requirements

Presentation:

- I. Examine product sketches or drawings
  - A. Observe notes
    1. Kinds of materials
    2. Use of stock items
  - B. Note single or multiple parts
    1. Number parts if not shown
  - C. Notice section drawings and auxiliaries for true shapes
  - D. Examine dimensions of detailed parts
- II. Fill out bill of material for each part
  - A. List part number
  - B. List number of pieces which are identical
  - C. List name of part
  - D. List exact or finished size of part
  - E. List kinds of material to be used
  - F. List how many finish size pieces will be made from one rough or standard size piece
    1. Observe standard sizes of material
      - a. Lumber specifications
      - b. Standard sizes of sheet stock
      - c. Standard sizes of rods, moldings, etc.
      - d. Hardware
    2. Combine rough sizes to list thickness, width and length into most efficient use of standard stock
  - G. Calculate required units in the rough
    1. Board feet
    2. Square feet
    3. Cubic feet
    4. Lineal feet
    5. Each
    6. Weight

- H. List price per unit
  - 1. Consult price lists in catalogs
  - 2. Contact local dealers
- I. Calculate cost of part or parts alike
- J. List all hardware to be used
  - 1. Price per unit
  - 2. Total cost of item
- K. Total costs
  - 1. Total cost of parts
  - 2. Add 15% of cost of parts for finishing materials, glue and incidental items
- III. Make out job tickets from material bill for each different part to be manufactured
  - A. Fill in part number, name of part, job number and kind of material
  - B. Fill in product name
  - C. Fill in rough and finished sizes
  - D. Sketch or draw any special details necessary in the space provided
    - 1. Shape of cutters
    - 2. Details of joints
    - 3. Location of holes
  - E. List operations to be performed to the part
  - F. Persons performing operations or filling out forms, sign in spaces provided.
    - 1. Check for completion
    - 2. Inspectors

References:

John Klok, Wood Production and Engineering.

See material bill form and job ticket form included.

Title: Process Engineering

Presentation:

- I. Reasons for planning flow of material through production
  - A. Organize need for manufacture
    1. Set up tools and equipment necessary
    2. Have workers available
    3. Transfer materials from one location to another
    4. Reduce rejects in the production process
  - B. Management can study production processes
    1. Bottlenecks and tie-ups in production
      - a. Breakdown of equipment
      - b. Work stoppage
      - c. Slow processes -- need for additional space and equipment
    2. Cost of production
      - a. Time study
      - b. Cost of individual production processes
      - c. Reduce overhead and waste
- II. Methods used to analyze production processes
  - A. Employ an Efficiency Engineer
  - B. Flow charts
  - C. Plant layouts
  - D. Exploded pictorials showing processes
  - E. Engineering process sheets
- III. Methods used to have efficiency in production
  - A. Moving materials
    1. Short a distance as possible to cut down time waste
      - a. Conveyors
      - b. Lifting devices
      - c. Trucks and dollies
    2. Location of equipment
      - a. Machines
      - b. Benches
      - c. Spaces for assembly of parts
      - d. Inspection stations

## B. Stacking materials

1. Place each piece the same way
2. Place in direction needed for next operation
3. Avoid damage in moving
  - a. Falling to floor
  - b. Scratching from materials and chips between stock

## C. Procedure of operations

1. Eliminate difficult machine operations
  - a. Correct process before another
  - b. System of squaring stock
    - 1) Thickness
    - 2) Width
    - 3) Length
  - c. Cutting multiple parts
  - d. Cutting and forming before abrading
  - e. Sub-assembly of component parts
2. Purpose of job ticket
  - a. Indicate completed operations
  - b. Indicate processes to follow
  - c. Indicate any information about part
    - 1) Finished and rough sizes
    - 2) Number of pieces alike
    - 3) Special details
  - d. Signature of employee who completed the operation
  - e. Signature or number of inspector

References: Harold T. Amrine, John Ritchey, Oliver Hulley,  
Manufacturing Organization and Management, pp. 252-276

**Title: Selection of Stock**

**Presentation:**

**I. Criteria for selecting stock**

**A. Points to consider**

1. Price
2. Size
3. Weight
4. Aesthetic
5. Practical for fabricating
6. Wearability

**II. Manufactured materials**

**A. Storage points for following:**

1. Wood
2. Steel metals, etc.
3. Plastics
4. Paper
5. Leather

**III. Size requirements**

**A. Standard sizes of stock**

1. Wood
2. Metals                    **Make stock to fit in multiples**
3. Plastic                   **for the least waste**
4. Paper
5. Leather

**IV. Fabricating materials**

**A. Factors to consider**

1. Texture
2. Warp, wind
3. Color
4. Size
5. Defects
6. Exposure

**References:**

**Gardner Boyd, Metalworking, p. 50**

**Willis Wagner, Woodworking, pp. 10-13**

Title: Using the Layout Tools

Presentation:

I. Definition of layout tools - tools used to measure, transfer measurements, check measurements, and mark

II. Measuring tools

A. Steel tape

1. Blades vary as to widths, markings, color
2. Lengths vary as to the need
3. Quickly gotten out and put away (handy)

B. Bench rule

1. Made of wood or steel
2. Come in lengths of 1', 2', and 3'

C. Zig-zag rule

1. Slow to take out and put away
2. Can be extended straight for 6'

III. Checking tools

A. Framing square

1. Used in construction
2. Consists of blade and tongue

B. Small framing square (same as framing square, except smaller)

C. Tri-square

1. Used for small work
2. Consists of blade and handle

D. Combination square

1. Part of combination square set
2. Can be used for many purposes
  - a. Checking squareness
  - b. Checking 45° angles
  - c. Measuring
  - d. Checking levelness
  - e. Measuring depth
  - f. Scribing

#### IV. Marking tools

- A. Pencil (use one heavy dark line, rather than two lines)
- B. Scratch awl
  - 1. Is substituted for a pencil
  - 2. Can be used to mark on most materials, except aluminum
- C. Marking gauge
  - 1. Used to mark on wood only
  - 2. Used to mark a line parallel to an edge

#### V. Transfer of measurement tools

- A. Inside calipers (used to find inside diameters by adjusting and measuring distances between points)
- B. Outside calipers (used to find outside diameters by adjusting and measuring distances between points)
- C. Dividers
  - 1. Used to scratch arcs and circles
  - 2. Used to transfer measurements
- D. Sliding T bevel (used to transfer angles)

#### References:

T. Gardner Boyd, Metalworking, p. 16.

Willis H. Wagner, Woodworking, pp. 19, 27, 29, 33



Title: How Cutting Tools Work

Presentation:

I. Definition of cutting

- A. Slicing material
- B. Chipping material
- C. Removing material

II. Types of cutting tools

A. Hand tools

- 1. Saws
  - a. Use
    - 1) Cutting stock to length
- 2. Chisels
  - a. Use
    - 1) Cutting ends of pins
- 3. Planes
  - a. Use
    - 1) Smoothing edges of stock

B. Machine Tools

- 1. Same cutting action
- 2. Covered by individual instruction

III. Safety involved

A. Personal and group

- 1. Related to hand tools
- 2. Related to machine tools

References:

John L. Feirer, Woodworking for Industry, pp. 178-181

Title: Use of Jigs and Fixtures

Presentation:

I. Definition

A. Jig

1. Holds work and guides the tool to it

B. Fixture

1. A holding device

II. Purpose

- A. To produce precision interchangeable parts

- B. Essential in the mass production of products

III. Use

- A. First used by Eli Whitney

- B. In parts manufacture and assembly

- C. Results in parts fitting together perfectly in assembly of products

- D. Manufacture standard replacement parts on products needing repair

- E. On all types tools, machines, and equipment used in production work

References:

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 214-217.

Title: Forming Tools and Equipment

Forming tools are hand or machine tools that give sheet material three-dimensional shape and rigidity by bending, hammering, and/or rolling.

Presentation:

I. Types of forming tools

- A. Bar folder
- B. Brake
- C. Roll former
- D. Anvil
- E. Hammer
- F. Stake
- G. Vise

II. Changes that can be made using these

- A. Angles
  - 1. 180° to limitation of brake or bar folder
- B. Bends
  - 1. Arcs
  - 2. Circles limited to roll size

III. Materials used in forming

- A. Iron
- B. Aluminum
- C. Copper
- D. Brass
- E. Stainless
- F. Tin

IV. Procedure in forming rectangular shape

- A. Break slide hem or seam

B. Break ends - 90° angle

C. Break sides - 90° angle

D. Assemble

References:

John Feirer and John Lindbeck, I. A. Metalwork, p. 80

Oswald Ludwig, Metalwork, p. 261

John Walker, Modern Metalworking, pp. 19-11

Title: How to Assemble Manufactured Parts

Presentation:

I. Using fasteners

A. Nails

1. Common
2. Box
3. Finish
  - a. Procedure
    - 1) Drive with claw hammer
    - 2) Drill hole or nail into stock

B. Screws (slotted and phillips)

1. Round head
2. Flat head
3. Oval head
  - a. Procedure
    - 1) Drill holes
      - a) Pilot
      - b) Shank
    - c. Countersink or bore
  - 2) Drive screw with screwdriver

II. Using adhesives

A. Glue

1. White liquid

B. Cement

1. Contact
2. Plastic

C. Procedure

1. Apply to surfaces
  - a. Squeeze on
  - b. Brush on
  - c. Rub on
2. Secure pieces
  - a. Clamping
  - b. Weight

References:

Delmar W. Olson, Woods and Woodworking for I. A., pp. 91-101

Title: Surface Preparation for Finishing

Presentation:

I. Inspect surface condition for a specified finish on wood

A. A good quality surface results in a good finish

1. Quality of surface for painting
2. Quality of surface for stains
3. Quality of surface for natural finish

B. Check for glue deposits

1. Around joints
2. Spills and finger prints

C. Check for pencil marks and soiled spots

D. Inspect edges, ends, surfaces, end grain of lumber

1. Chips and dents
2. Holes and cracks
3. Test by observation, looking toward light for machine marks
4. Scratches from small particles between pieces

II. Condition the surface for quality desired

A. Remove machine marks

1. Saw tooth cutting marks from circular saw
2. Machine marks from jointer and planer
3. Saw machine marks from band and scroll saw
4. Wood burrs from drilling

B. Remove all traces of glue

C. Set nails below the surface

D. Fill holes and cracks with desired fillers - either before or after finish is applied

E. Round or break all sharp edges to prevent finish from wearing off

F. Final hand sanding

G. Remove dust particles

1. Air blast
2. Vacuum cleaner
3. Moist cloth

References:

John L. Feirer, Industrial Arts Woodworking, p. 168

Willis H. Wagner, Woodworking, p. 51

Title: Available Finishes and Methods of Application

Presentation:

I. Types of finishes and their solvents

A. Paint

1. Water base - water
2. Oil base - turpentine - paint thinner

B. Varnish - turpentine

C. Shellac - alcohol

D. Lacquer - lacquer thinner

II. Methods of application

A. Brushing

B. Rubbing

C. Spraying

D. Dipping

III. Procedure

A. Apply desired number of coats

B. Allow sufficient drying time between each coat

C. Rub down or sand each coat, depending on finish

D. Clean application equipment after each coat

References:

John L. Feirer, Woodworking for Industry, pp. 589-608



Title: Inspection Methods

Presentation:

I. Introduction

A. Done individually by all every day (judge consumer products)

1. Things we buy
2. Things we eat
3. Services performed for us

II. Definition - to look over critically; view carefully or closely

III. Industrial inspection

A. Purchased material inspection

B. In-process inspection

1. Informal (done by worker)
2. Formal (done by inspectors)
  - a. How?
    - 1) Visually
    - 2) By jigs
    - 3) Tools designed for this purpose
  - b. Where?
    - 1) On the line (full time)
    - 2) At the machine
    - 3) Roving or partial inspection

C. Final inspection

IV. Why inspect?

- A. More uniform product
- B. Catch errors
- C. Saves materials and labor costs
- D. Improves relation with customers
- E. Points out trouble spots

References:

Harold T. Amrine and others, Manufacturing Organization and Management, p. 277-291

Title: Packaging a Product

Presentation:

I. Purpose of packaging

A. Protects product

1. During shipping and selling

B. A method of advertising

1. To attract the customer

II. Types of packages

A. Boxes

1. Paper
2. Cardboard
3. Metal
4. Plastic

B. Bags

1. Paper
2. Plastic
3. Cellophane

C. Jars

1. Glass
2. Plastic

D. Bottles

1. Glass
2. Plastic

E. Cartons

1. Paper
2. Plastic

F. Crates

1. Wood and metal
  - a. Used usually for large and heavy products

III. Packaging process

A. By hand

B. By machine

References:

Lawrence L. Bethel, Franklin S. Atwater, George H. E. Smith, Harvey A. Stackman, Jr., Industrial Organization and Management, pp. 276-278

Title: Evaluating Products

Presentation:

I. Comparison of well made products to inferior ones

- A. Prices
- B. Materials
- C. Construction
- D. Operation

II. Consumer value of a product

- A. Quality of finish
- B. Practicality of product
- C. Functional aspect
- D. Duration of usefulness
- E. Workmanship and design

III. Perform inspection of parts

- A. Check for correct measurements
- B. Check for proper fit of parts
- C. Check for finish of parts
- D. Final inspection of finished product

References:

Consumers Union, Consumer Reports, pp. 4-7.

Title: Industrial Organization

Presentation:

I. Importance of organization

A. Coordinates all phases of the functions of industry

1. Stockholders to workers

II. Typical corporate organization (line and staff)

A. Owners of the company

1. Stockholders

B. Owners representatives (administrators)

1. Board of directors

C. Executives

1. V. P. Finance
2. V. P. Engineering
3. V. P. Manufacturing
4. V. P. Personnel
5. V. P. Marketing

D. Middle management

1. Managers and superintendents

E. Supervisors

1. Assembly
2. Parts manufacture
3. Quality control

F. Section of line chiefs

G. Foremen

1. One each shift

H. Workers

III. Organization in Industrial Arts laboratory

- A. Need same as in industry
- B. Set up a type of line and staff pupil personnel organization
  - 1. Elect personnel or have them apply for management jobs in organization
    - a. Job qualifications
    - b. Responsibility of specific jobs

References:

Lawrence L. Bethel, Franklin Atwater, George Smith, Harvey Stackman, Jr., Industrial Organization and Management, pp. 36-47

Carl Gerbracht and Frank Robinson, Understanding America's Industries, pp. 226-227.

Title: Industrial Personnel and their Responsibilities

All pupils have at one time or another taken leadership roles in the ordinary types of games and activities we usually play in our routine day to day living. Many have had experiences of losing if the leadership is not capable. After completing this lesson, we hope the pupil will accept a position in the company according to his potential.

Presentation:

I. Leadership

A. Types

1. Captain
2. Foreman
3. Head of Department
4. Group leader
5. Father, Mother

II. Assignment according to pupil interest

A. Plant Superintendent

1. Oversees entire personnel system
2. Checks attendance
3. Calls attention of foremen to close of period
4. Reports to instructor

B. Research and industrial relations

1. Keeps research and planning materials and facilities in order
2. Provides public relations through bulletin boards and literature

C. Industrial Engineer

1. Checks all tools at the end of period and reports to the superintendent
2. Inspects machinery and accessory panels
3. Keeps tool boards and cabinets in good order

D. Maintenance Foreman

1. Oversees all maintenance personnel
2. Makes substitutions for absent members
3. Reports to superintendent when machines are inoperative

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3. Reports to superintendent when machines are inoperative



E. Safety Engineer

1. Keeps a check on first-aid supplies
2. Reports any injury to the instructor immediately
3. Checks conditions of tool and equipment and reports safety hazards

References:

Association of Consulting Managements Engineers, Inc., Common Body of Knowledge for Management Consultants.

Donald E. Cook, Marvels of American Industries, pp. 261-64

Carl Gerbracht, Frank Robinson, William Hanks, Understanding America's Industries, p. 230.

Robert Haws, Manufacturing in the School Shop, pp. 37-38.

Gordon Wilber, Norman Pendered, Industrial Arts in General Education, p. 211.

Title: Labor Organizations

Presentation:

- I. Definition of labor unions (groups of employees organized to promote a common interest)
- II. Terms of labor unions
  - A. Strike - when workers stop working to get management or owners to meet demands
  - B. Picketing - method used to get other union members to do business with management of the company being picketed, usually carrying picket signs
  - C. Boycott - union members and others do not buy certain products
  - D. Management - owners, employers
  - E. Labor - people who do the work (production) employees
- III. Types of unions
  - A. Craft unions (workers of a single craft - painters, plumbers, carpenters)
  - B. Industrial unions (workers in a single plant or industry)
- IV. History of union in America
  - A. Many organized in latter 1700's (1792-1810)
  - B. American Federation of Labor started in 1886 (Samuel Compers)
  - C. Congress of Industrial Organization - 1938 (John L. Lewis)
  - D. Merger of AFL-CIO (1955)
- V. Advantages of unions
  - A. For labor (employees)
    1. To increase wages
    2. Fringe benefits
    3. Shorter hours
    4. Better working conditions
    5. Security

B. For management (employers)

1. To be able to negotiate with labor as one group
2. To be able to have certain standards of production and wages which both management and labor agree on

VI. Disadvantages of unions

- A. Cause of loss to employers
- B. Cause of loss of income to employees during a strike
- C. Cause of loss of services to the public (telephone strike)

References:

"Labor Relations," The Lincoln Library of Essential Information, pp. 1225-33, 22nd edition

Title: The Seven M's of Manufacturing

Presentation:

I. Introduction

- A. Many people find modern manufacturing too difficult to understand
- B. Approximately 80% of high school graduates will be involved in manufacturing to earn their livelihood

II. Money

- A. Needed to buy machines, buildings, materials
- B. Can be obtained from individuals, banks government and selling of stock

III. Machines

- A. Machines do work faster and more accurately than hand methods
- B. Must be up-to-date to compete with others

IV. Materials

- A. Raw materials should be close to the industry
- B. Must be at the right place at the right time

V. Methods

- A. Products must be turned out fast, at a low cost, with quality

VI. Markets

- A. Advantage to be close to the industry
- B. Items that appear on the market must be saleable

VII. Men

- A. People who work in industry, both management and labor
- B. Jobs may change, but men will still be needed

VIII. Management

- A. Key to the success of the industry
- B. If the pilot fails, the plane fails

IX. Review points covered

References:

Harold T. Amrine and others, Manufacturing Organization and Management, p. 7

Robert W. Haws and Carl J. Schaefer, Manufacturing in the School Shop, p. 4

Note: A jet plane (Northeast Yellowbird model) was used to illustrate, summarize and compare the seven functions of manufacturing, as follows:

|                 |            |
|-----------------|------------|
| Money.....      | Engines    |
| Machines.....   | Wings      |
| Materials.....  | Stabilizer |
| Methods.....    | Tail fins  |
| Markets.....    | Tail fins  |
| Men.....        | Fuselage   |
| Management..... | Pilot      |

ASSIGNMENT

Name \_\_\_\_\_

Define the terms below:

A game (indoor or outdoor) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

A toy \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

---

On the space below or the attached sheet, describe an idea for a game or toy which you think the class would like to manufacture. Plan to try to sell your idea to the others in the class, by using a picture, a rough sketch, a sample or by demonstration of an original game or toy.

If your game or toy is selected, you will receive a special bonus.

A good game or toy product should have commercial value, be interesting enough to others to sell itself, and be within the capacity of the laboratory. The product should involve two or more materials.

---

UNIT EVALUATION:

Multiple Choice: To the left of each statement, place the letter that best completes the statement correctly.

Example:

b On a clear, sunny day, the sky is (a) green, (b) blue, (c) pink, (d) brown.

---

b In preparing a product for the finishing operations, glue deposits may be (a) left on the material, (b) sliced off and material sanded, (c) sanded lightly, (d) covered up with stain.

c Sharp edges on a product as a result of tool and machine operations should be (a) left as they are, (b) sanded off by belt sander, (c) slightly rounded by hand sanding, (d) cut off with a wood chisel.

d A job ticket contains information for (a) a new job for workers, (b) job analysis, (c) tools for the job (d) a description of a single part of a product and the operations to be performed.

c The best form for presenting information of a new idea would be (a) a photograph, (b) a composition, (c) a working sketch, (d) a complete set of drawings of all the detailed parts.

c Material bills should be filled out (a) after the product has been completed, (b) as the pieces of material are cut to shape, (c) after working sketches are approved, (d) to keep track of the parts as they are assembled.

c A device used in production work to hold the work and guide the tool is called a (a) clamp, (b) fixture, (c) jig, (d) holding device.

d Credit for the first mass production factory as we know it today is given to (a) Oliver Evans, (b) Eli Whitney, (c) John Pontiac, (d) Henry Ford.

b Ownership is a (a) false, (b) legal, (c) labor, (d) illegal term.

a Which of the following would be the administrators of a corporation: (a) board of directors, (b) V.P. of marketing, (c) supervisors, (d) workers.

d What is not considered necessary when selecting stock for indoor games and toys? (a) color, (b) defects, (c) size, (d) exposure

- d Which one of the following is not a purpose for inspection?  
 (a) for a more uniform product, (b) to catch errors, (c) to save material, (d) to increase the cost.
- d Which one of the following is not a cutting tool? (a) cross cut saw, (b) flat chisel, (c) block plane, (d) claw hammer.
- c Which of the following are types of fasteners? (a) finish nails, (b) flat head wood screws, (d) contact cement (c) all of these.
- d Which of the following are methods of applying a finish?  
 (a) rubbing on, (b) spraying, (c) dipping, (d) all of these.
- b Which of the following is a condition of the surface material?  
 (a) color, (b) texture, (c) shape, (d) balance.
- d Which of the following concepts deal with human relationships?  
 (a) self control, (b) promote fair play, (c) reveal good sportsmanship, (d) all of these.
- b Which of the following tools is used to scratch arcs and circles?  
 (a) sliding T-bevel, (b) dividers, (c) inside caliper, (d) hammer.
- a The department in industry that deals with designing and planning is (a) engineering, (b) production, (c) marketing, (d) management.
- a A machine that is not used for cutting is the (a) pan brake, (b) shears, (c) notcher, (d) snips.

Completion: Directions: Place the correct word or words on the line required. Each correct answer is worth one point. The first is done for you.

Example: The color of snow is (white).

1. A tool used to layout materials at right angles and for marking parallel lines is called (combination square).
2. A flow chart would be worked out with the (engineering) department.
3. If the product you are making is two feet long, you should buy materials in multiples of (2) or (4) feet.
4. Chisels remove materials by (slicing) away.
5. Before using a screw to fasten a (pilot), (shank), and (countersink (bore)) must be drilled.
6. Alcohol is used as a thinner for (shellac).



7. The Seven M's of Manufacturing are:

(Men)

(Management)

(Markets)

(Methods)

(Money)

(Materials)

(Methods)

8. What is the key to the success of any industry? (Management)
9. Why would it be advantageous to an industry to be located close to the supply of raw materials? (Cut shipping costs)
10. What might be some sources of money to start a company?  
(Banks) (Government) (Sell shares of stock)
11. Approximately what percent of the high school graduates of today will earn their living with occupations involved in manufacturing?  
(80%)
12. What are three proper tools to be used to mark on materials?  
(Scratch awl) (Pencil) (Knife)
13. Man needed to experiment with (games) to improve his skills and strengths.
14. A reason for packaging a product would be to (protect it).
15. Three types of packages for manufactured products would be:  
(boxes) (bags) (jars)
16. Manufacturing products with many parts in large quantities is referred to as (mass production).
17. The owners of a corporation are called (stockholders).
18. Three common types of ownership found in industrial enterprises are (single ownership), (partnership), (corporation)
19. A holding device used in production work is referred to as a (fixture).
20. Production engineers decide and make up (flow) charts and diagrams to organize the production process.

True or False

Circle the correct letter in space provided.

- T F People in leadership positions should assume less responsibility.
- T F Shape is a factor to consider when ordering materials.
- T F Aviations snips are designed to cut sheet metal.
- T F The games and toys industry produces over one billion dollars worth of goods yearly.
- T F Some inspection is done by each of us daily.
- T F Informal inspection is done by each worker.
- T F Cutting may be defined as the chipping away of material.
- T F Screws have greater holding power than nails.
- T F Oil base paint is thinned with water.
- T F A combination square would be a useful square in the home.
- T F An advantage of steel tapes is they come in long lengths.
- T F We have learned to play from ancient man.
- T F Mass production is a major method of manufacturing.
- T F Organization is an essential part of the industrial arts laboratory.
- T F Partnerships are the most common types of industrial ownership.
- T F Eli Whitney was the early pioneer in the use of jigs and fixtures.
- T F Brainstorming is a good way to find new product ideas.
- T F A new product should be considered for functional value as well as appearance.
- T F A flow chart is designed to show the manufacturing process to visitors.
- T F Fixtures are used to guide a tool in duplicate production.

Matching Test:

Directions: Place the letter of the word in the right column, in the space provided, next to the phrases in the left column which it matches. The example is done for you.

Example:  a  Part of an apple      a. seed

The following deal with unions:

- |     |                                              |                |
|-----|----------------------------------------------|----------------|
| ___ | Workers stop work for better conditions      | a. strike      |
| ___ | People who produce the product for a company | b. union       |
| ___ | People who run the company                   | c. picketing   |
| ___ | When people carry signs to prevent business  | d. boycott     |
| ___ | When people won't buy a certain product      | e. management  |
| ___ | An organization of workers                   | f. labor       |
|     |                                              | g. scab        |
|     |                                              | h. closed shop |

The following deal with tools and tool processes:

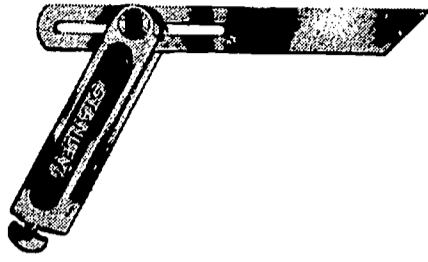
- |     |                               |                 |
|-----|-------------------------------|-----------------|
| ___ | Laying out for holes          | a. prick punch  |
| ___ | Cutting wood off to length    | b. jib          |
| ___ | Making a 5/16" hole in metal  | c. abrasive     |
| ___ | Prepare surface for finishing | d. drill        |
| ___ | Making interchangeable parts  | e. crosscut saw |
|     |                               | f. center punch |
|     |                               | g. compass saw  |
|     |                               | h. bit          |

The following deal with industrial terms:

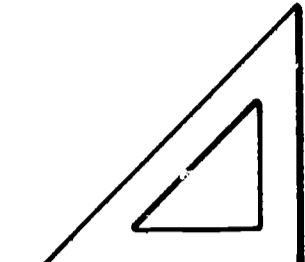
- |     |                                            |                                 |
|-----|--------------------------------------------|---------------------------------|
| ___ | Ownership by two or more people            | a. Partnership                  |
| ___ | Manufacturing products in large quantities | b. Corporation                  |
| ___ | Inspection of products                     | c. Mass production              |
| ___ | Concentration on one skill area            | d. Quality control              |
| ___ | Ownership by stockholders                  | e. Line production              |
|     |                                            | f. Single ownership             |
|     |                                            | g. Specialization               |
|     |                                            | h. Individual<br>proprietorship |

TOOL IDENTIFICATION

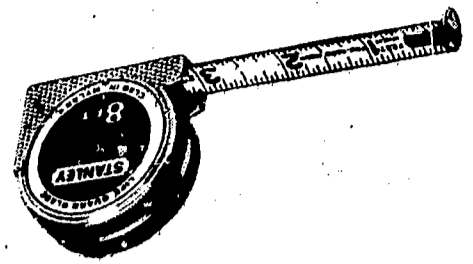
Directions: Place the correct name of the tool on the blank provided below each picture. The example is done for you.



1. \_\_\_\_\_



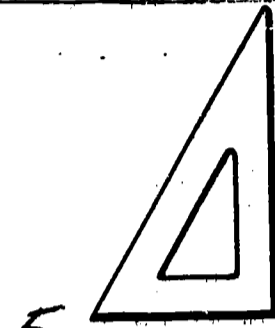
2. \_\_\_\_\_



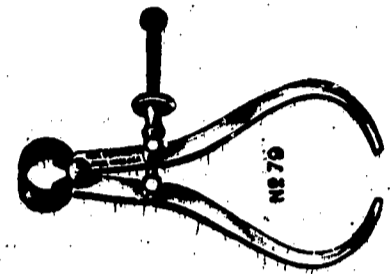
3. \_\_\_\_\_



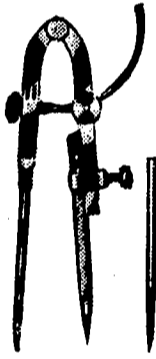
4. \_\_\_\_\_



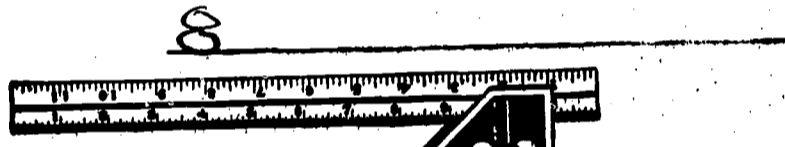
5. \_\_\_\_\_



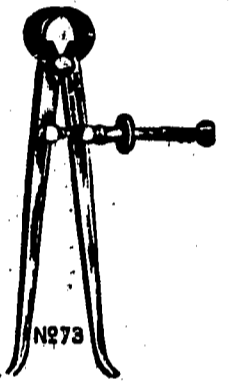
6. \_\_\_\_\_



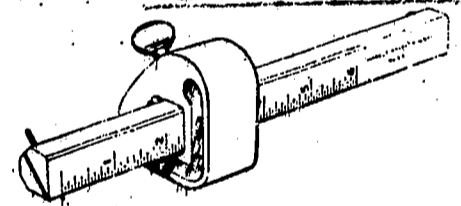
7. \_\_\_\_\_



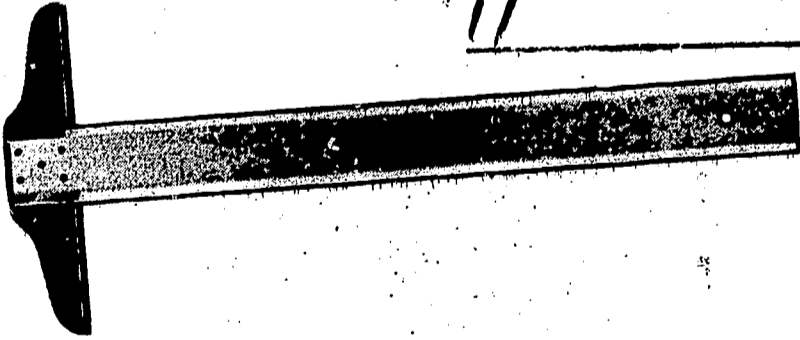
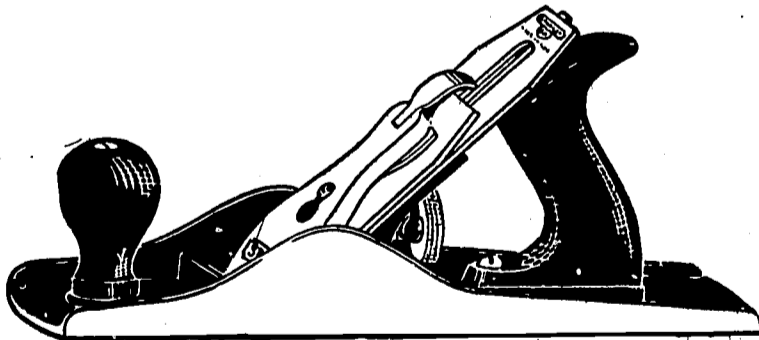
8. \_\_\_\_\_



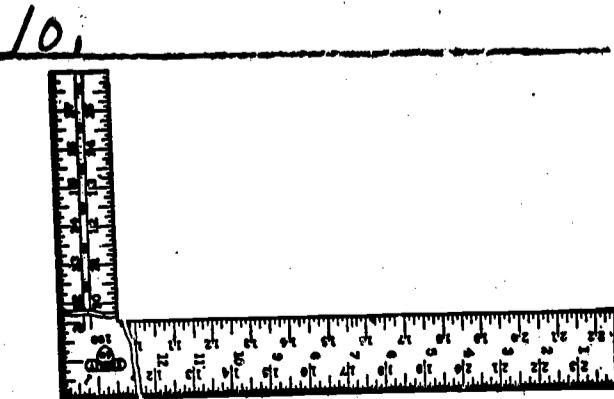
9. \_\_\_\_\_



11. \_\_\_\_\_

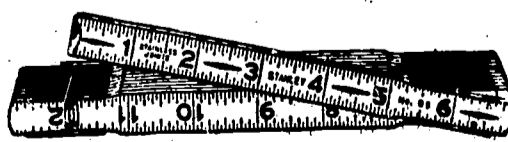


12. \_\_\_\_\_

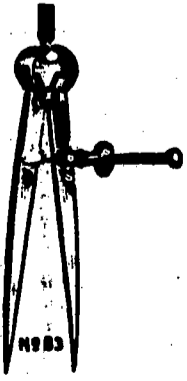


10. \_\_\_\_\_

13. \_\_\_\_\_



14. \_\_\_\_\_



15. \_\_\_\_\_

August 2, 1968

GAME BOARD by Irishwood, Inc.

At one end, a peg game will be found which tests your ability to foresee the next move. The object of the game is to start with one hole open, then jump and remove pegs until all but one peg is left. Another test would be to end the remaining peg in the open starting hole.

At the other end, you have the conventional cribbage game scoreboard. Cribbage is an exciting game which can be played by 2, 3 or 4 players. The board is used to keep score by moving the rear peg ahead of the other for the number of points gained. Pegs are moved up the outside and down the inside and then repeated to make a total of 120 points, plus one for pegging out of the game.

The aluminum box holds a deck of cards and the pegs.

The person sitting clockwise to the dealer has first count. For further instructions, see a game book or someone who can play the game.

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Scoring Points

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| Within counting limit<br>of 31 points | Reason for points                                                                                      | Points in Hand | In Crib  |
|---------------------------------------|--------------------------------------------------------------------------------------------------------|----------------|----------|
| 2                                     | Pairs                                                                                                  | 2              | 2        |
| 6                                     | Triplets                                                                                               | 6              | 6        |
| 12                                    | Fours                                                                                                  | 12             | 12       |
| 2                                     | Each 15                                                                                                | 2              | 2        |
| 3                                     | 3 cards in sequence 9<br>(called a run)                                                                | 3              | 3        |
| 1                                     | Each additional card in<br>sequence                                                                    | 1              | 1        |
|                                       | Double run of 3 cards (two<br>runs of 3 and 1 pair)                                                    | 8              | 8        |
|                                       | Double run of 4 cards (2<br>runs of four and 1 pair)                                                   | 10             | 10       |
|                                       | Triple run - Triplets and<br>two other cards in<br>sequence. For triplets and<br>9 for three card runs | 15             | 15       |
|                                       | Quadruple run - 2 pairs and a<br>card in sequence. Four 3-<br>card runs, 12; and 2 pair<br>for 4       | 16             | 16       |
|                                       | 4 cards in hand - 1 suit                                                                               | 4              | No score |
|                                       | 4 cards in hand - 1 suit<br>and "Starter" same suit                                                    | 5              | 5        |
|                                       | Jack held in hand or Crib<br>which is same suit as<br>"Starter"                                        | 1              | 1        |

(Continued)

While setting down cards: 2 for 15 points  
2 for 31 points  
1 for go or last card, if not exactly 31

Starter jack turned up by dealer on cut - 2 points

2 players deal 6 cards - 4 for hand, 2 for Dealer's Crib  
4 players deal 5 cards - 4 for hand, 1 for Dealer's Crib  
3 players deal 5 cards - 4 for hand, 1 for Dealer's Crib, plus  
1 from the deck

W. C. Horn Brothers and Company, Newark, New Jersey - New York, New York