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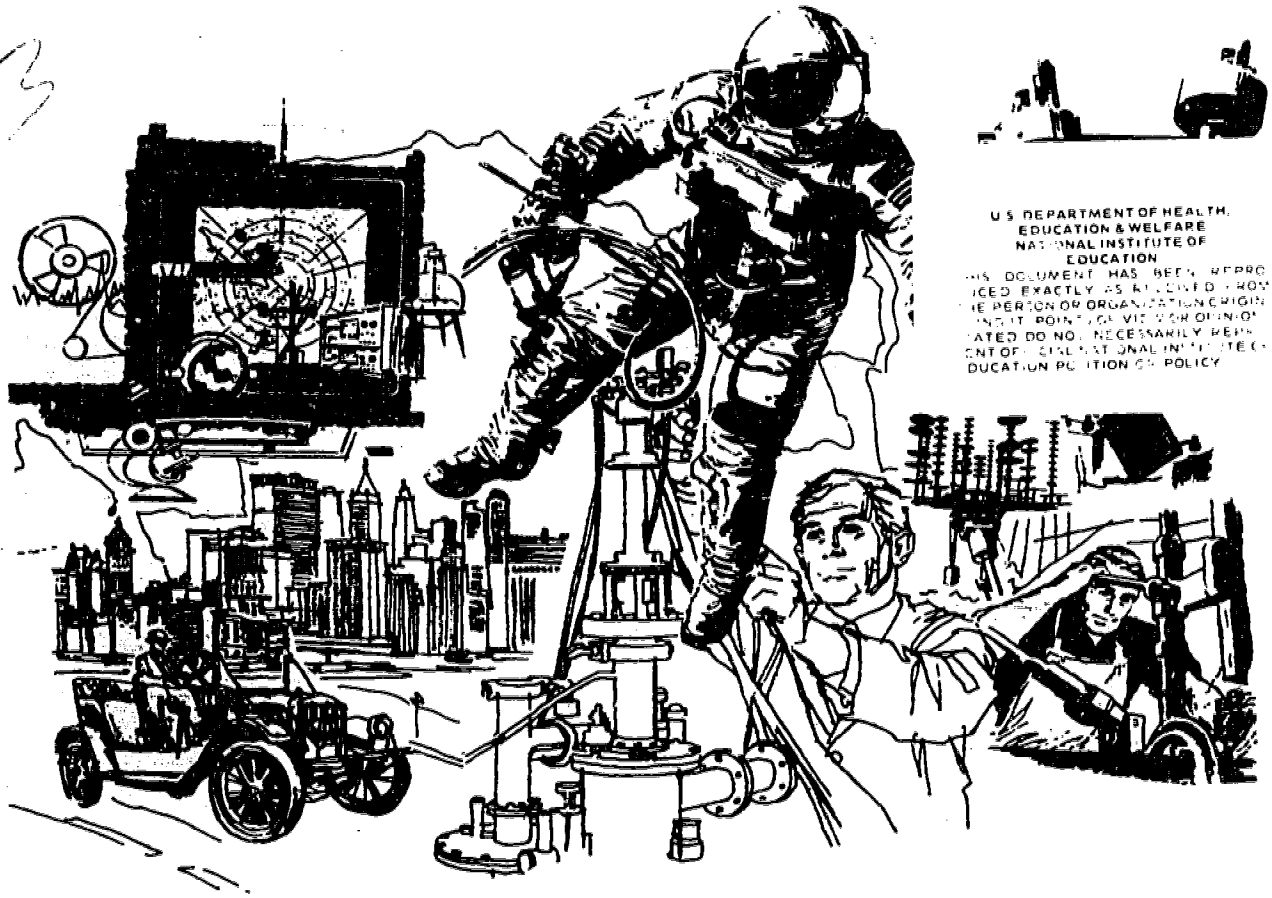
ABSTRACT

Several intermediate performance objectives and corresponding criterion measures are listed for each of the three categories (Manufacturing, Graphic Communication, and Power) included in this second of a two-volume course guide on American industries. The materials were developed for a 9- to 12-week course for seventh grade students to acquaint them with the concepts of major American industrial enterprises. The manufacturing category includes ten terminal objective sections: Classification of Metals, Layout, Cutting, Drilling, Forming, Finishing, Fastening, Quality Control, Mass Production, and Occupations. The graphic communication section includes seven terminal objective sections: Introduction, Occupations, Printing, Rubber Stamp, Special Printing Process, Offset Press, and Drawing. The power section includes four terminal objective sections: Occupations, Electricity, Combustion Engines, and Simple Machines. (This manual and 54 others were developed for various secondary level vocational courses using the System Approach for Education (SAFE) guidelines.) (HD)

# PERFORMANCE OBJECTIVES

# American Industries









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Volume 2

DUVAL COUNTY PUBLIC SCHOOLS
July, 1975

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## MAKE UP AND USE OF THIS MANUAL

Definitions:

Terminal Performance Objectives - are objectives referring to a behavior, knowledge, or skill you want the learner to demonstrate at the end of a particular unit or section. They are written in gross, overall terms.

Intermediate Performance Objectives - are sub-functions of terminal objectives referring to a behavior, knowledge or skill you want the learner to demonstrate along the way towards mastery of the terminal objectives. They are written in specific terms.

Criterion Evaluation - are the actual tests of evaluation exactly as it will be presented to the learner to see if he has met the objectives.

Method Media Analysis - specifically refers to personnel resources, tools, vehicles, software, and hardware - the physical hows for implementing the methods or ways of curriculum implementation. (Each media center is different in the materials available to assist the instructor in lecturing and demonstrating. Therefore, the individual instructor must research the school's media center for the appropriate materials to be used.)

Levels of Performance - The levels of performance (how well it must be done) given in this manual have been arrived at by the authors through past experiences and by consultation with other Industrial Arts teachers in Duval County. These levels are subject to change after try out. They are written as average levels of attainment that all students should achieve. This by no means limits the instructor, who can teach as far above the level as possible.

These objectives are minimal - The objectives in this manual represent the basic "need to know" knowledge and skills that should be attainable by any student that meets the prerequisites of the courses.

Course Prerequisites - The prerequisites for these courses may need revision. For example, if your course calls for a certain skills in reading ability and you are getting students below this ability that cannot perform up the course standards, then a prerequisite of "must be able to read at the ___ level" may be needed.

## INTRODUCTION

This manual of Performance Objectives has been re-written and revised from the original manual introduced for the 1972-1973 school year. A pre and post examination has been added to test the level of attainment of each learner before any instruction and to be used again at the completion of the course as a final examination. It also includes Learning Steps, Criterion Evaluation and Methods-Media Sections.

Your own teaching methods and equipment may change the chronological order in which the objectives are here-in presented. Also, it is not necessary to use a specific objective as written as each may be altered to fit your own particular situation. It should be your responsibility to cover the material given so as to insure course content and uniformity of instruction throughout the system.

The Media of instruction for each Intermediate Performance Objective should be from the State of Florida Adopted Textbook listings and your should select those to which you have access. Any additional materials should be used at your own discretion.

In revising this edition from its original form, an attempt has been made to eliminate as much of the mechanics of teaching as possible. Employ your own methods and use the equipment you have available. The emphasis is placed on learning the core of each particular area and not on how it should be taught. This manual is not intended to dictate nor limit your program but should be used as a guide for the course for which it is intended.

The Time Requirements section of each Learning Step has been omitted so that you can make your own entries for future reference.

Lowell T. Hudson
Supervisor of Industrial Arts
Duval County School Board

# AMERICAN INDUSTRIES

## Manufacturing

COURSE AMERICAN INDUSTRY

(M A N U F A C T U R I N G)

TERMINAL PERFORMANCE
OBJECTIVE NO. 1.0 — C l a s s i f i c a t i o n o f M e t a l s

The learner will, in writing, define the basic terms of metal classification, and visually identify six (6) commonly used metals with 75% proficiency.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 1.1 | The learner will define in writing the following terms:<br>1. ferrous<br>2. non-ferrous<br>3. alloy | 1.1 | Define, in writing, the following terms. |
| 1.2 | The learner will visually identify six (6) commonly used metals of the manufacturing industry.<br><br>1. steel (tooling)<br>2. cast iron<br>3. aluminum<br>4. copper<br>5. lead<br>6. steel (mild) | 1.2 | Visually identify the six (6) metals displayed. |
| 1.3 | The learner will, using a bar magnetic, separate given metal samples into two (2) groups.<br><br>Ferrous<br>Non-ferrous | 1.3 | Using the bar magnetic, separate the metal sample given you into two (2) groups. |

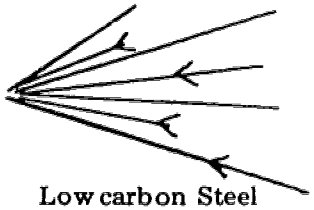
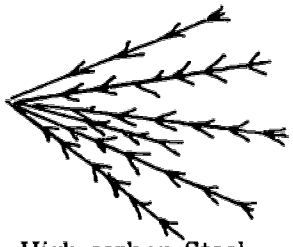
COURSE AMERICAN INDUSTRY

(M A N U F A C T U R I N G)

TERMINAL PERFORMANCE OBJECTIVE NO. 1.0

Classification of Metals

(Cont.)

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 1.4 | Given several pieces of steel, the learner will conduct a spark test on a grinding wheel to determine carbon content.<br><br>Spark Pattern<br><br>  <br>Low carbon Steel<br><br>  <br>High carbon Steel | 1.4.1 | After a demonstration by the instructor of the operation of the grinder, conduct a spark test on several pieces of steel to visually determine the carbon content of each. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 1.0

INTERIM PERFORMANCE OBJECTIVE 1.1) (1.2) (1.3)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 1.1.1 | Recognize terms. | 1.1.1 | Select and underline terms of metal classification. | 1.1.1 | Textbook<br>Chalkboard | |
| 1.1.2 | Define terms | 1.1.2 | Write response. | 1.1.2 | Textbook<br>Demonstration<br>Samples | |
| 1.2.1 | Inspect metal samples | 1.2.1 | Identify metal samples. | 1.2.1 | Six (6) metal samples | |
| 1.2.2 | Identify and separate metal samples by color. | 1.2.2 | Visually compare color of metal samples with chart. | 1.2.2 | Color chart | |
| 1.2.3 | Name metal samples. | 1.2.3 | Record results. | 1.2.3 | Chalkboard | |
| 1.3.1 | Test the magnetic properties of the metal bar. | 1.3.1 | Identify ferrous (low) metal from metal samples with the use of a bar magnet. | 1.3.1 | Bar Magnet<br>Metal Samples | |
| 1.3.2 | Separate metals into two (2) | 1.3.2 | Record results in writing of above | 1.3.2 | Record sheet | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 1.0

INTERIM PERFORMANCE OBJECTIVE 1.4

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 1.4.1 | Observe safe operation of grinder. | 1.4.1 | Safe operation of grinder. | 1.4.1 | Demonstration | |
| 1.4.2 | Apply metal sample to grinding wheel. | 1.4.2 | Visually observe sparks from grinding wheel. | 1.4.2 | Grinder<br>Safety Glasses<br>Metal Sample | |
| 1.4.3 | Separate metals by catagory. | 1.4.3 | Record in writing results and identify metals with obtained information. | 1.4.3 | Metal Sample<br>Textbook | |

COURSE AMERICAN INDUSTRY

(M A N U F A C T U R I N G)

TERMINAL PERFORMANCE OBJECTIVE NO. 2.0 — Layout

The learner will, given a template, transfer the pattern onto sheet metal using the scribe within 1/16 inch, with a proficiency of 80%.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 2.1 | The learner will orally identify the hand tools required to make a sheet metal layout.<br>1. template<br>2. scratch awl<br>3. ruler | 2.1 | Identify orally the hand tools used to lay out sheet metal. |
| 2.2 | Using the scratch awl, the learner will transfer a layout from the template to sheet metal. | 2.2 | Using a scratch awl and ruler, transfer the layout to the sheet metal. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 2.0

INTERIM PERFORMANCE OBJECTIVE (2.1) - (2.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 2.1.1 | Recall hand tool identification. | 2.1.1 | Recognize hand tools. | 2.1.1 | Lecture<br>Textbook<br>Hand Tools | |
| 2.1.2 | Identify hand tools by name and function. | 2.1.2 | Orally identify hand tools and give function of each. | 2.1.2 | Hand Tools | |
| 2.2.1 | Recall correct use of hand tools to transfer layout. | 2.2.1 | Correctly use hand tools to transfer layout. | 2.2.1 | Demonstration<br>Lecture<br>Hand Tools<br>Sheet Metal | |
| 2.2.2 | Transfer layout to sheet metal. | 2.2.2 | Completed sheet metal layout. | 2.2.2 | Hand Tools<br>Sheet Metal<br>Template | |

COURSE AMERICAN INDUSTRIES

(M A N U F A C T U R I N G)

TERMINAL PERFORMANCE
OBJECTIVE NO. 3.0 Cutting -

The learner will orally identify the hand tools required to cut metal and will use the appropriate tools to cut out his sheet metal pattern with a 75% proficiency.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 3.1 | The learner will orally identify the hand tools required to cut sheet metal:<br>1) tin snips<br>2) aviation snips<br>3) abrasive material<br>4) file | 3.1.1 | From a display, orally identify the hand tools required to cut sheet metal. |
| 3.2 | The learner will use the appropriate sheet metal snips to cut out his sheet metal part. | 3.2.1 | Using the appropriate sheet metal snips, cut a sheet metal part. |
| 3.3 | Using a file and abrasive material, the learner will remove all burrs and sharp edges from his product. | 3.3.1 | Using a file and abrasive material, remove all burrs and sharp edges from the sheet part. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0

INTERIM PERFORMANCE OBJECTIVE (3.1)--(3.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.1.1 | Observe hand tool demonstration. | 3.1.1 | Recall correct use of hand tools. | 3.1.1 | Hand Tool display<br>Demonstration<br>Film<br>Lecture<br>Textbook | |
| 3.1.2 | Identify tools by name and give function of each. | 3.1.2 | Orally identify hand tools and give function of each. | 3.1.2 | Display<br>Lecture | |
| 3.2.1 | Recall the appropriate hand tool to perform the cutting operation. | 3.2.1 | Identify the correct tool to perform the cutting operation. | 3.2.1 | Hand tool display<br>Demonstration<br>Lecture<br>Textbook | |
| 3.2.2 | Perform the cutting operation. | 3.2.2 | Cut sheet metal pattern with appropriate sheet metal. | 3.2.2 | Hand Tool Display<br>Lecture<br>Textbook<br>Demonstration | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0

INTERIM PERFORMANCE OBJECTIVE 3.3

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.3.1 | Recall the appropriate tools and materials to remove burrs and sharp edges. | 3.3.1 | Select the correct tools and materials to remove burrs and sharp edges. | 3.3.1 | Hand Tools<br>Demonstration<br>Lecture | |
| 3.3.2 | Recall the deburring operation using the file. | 3.3.2 | Deburr edges of sheet metal. | 3.3.2 | File | |
| 3.3.3 | Using an abrasive cloth, remove sharp edges of sheet metal. | 3.3.3 | Remove sharp edges of sheet metal. | 3.3.3 | Abrasive cloth | |

COURSE AMERICAN INDUSTRIES

(M A N U F A C T U R I N G)

TERMINAL PERFORMANCE
OBJECTIVE NO. 4.0 Drilling

The learner will orally identify the tools necessary to locate and drill holes in Sheet Metals and will perform the hole drilling operation with 80% proficiency.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 4.1 | The student will orally identify the tools used to locate and drill hole in sheet metal.<br><br>1. center punch<br>2. hammer<br>3. hand drill<br>4. electric drill motor<br>5. twist drill bit | 4.1.1 | Identify the displayed tools needed to located and drill holes in your sheet metal. |
| 4.2 | After an instruction demonstration the learner will use a center punch, hammer and electric hand drill or drill press to locate and drill all holes in his sheet metal product. | 4.1.1 | Locate and drill all holes in your sheet metal product. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 4.0

INTERIM PERFORMANCE OBJECTIVE (4.1)-- (4.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 4.1.1 | Recall hand tools used to drill holes. | 4.1.1 | Select hand tools and equipment used to drill holes. | 4.1.1 | Hand Tools<br>Center Punch<br>Hammer | |
| 4.1.2 | Identify tools by name and function. | 4.1.2 | Orally identify hand tools and give function of each. | 4.1.2 | Hand Drill<br>Electric Drill<br>Twist Drill Bit | |
| 4.2.1 | Recall proper operation of tools used to drill and deburr holes. | 4.2.1 | Orally review method of operation of tools used to drill and deburr holes. | 4.2.1 | Hand Drill<br>Electric Drill<br>Twist Drill Bits<br>Chuck Key<br>File | |
| 4.2.2 | Perform the drilling and deburring | 4.2.2 | Drill and deburr holes in parts. | 4.2.2 | Metal Parts<br>Electric Drill Motor<br>Twist Drill Bits<br>Hand Drill | |

COURSE AMERICAN INDUSTRIES

TERMINAL PERFORMANCE
OBJECTIVE NO. 5.0 Forming

The learner will orally identify and properly use the appropriate equipment to form a three dimensional sheet metal product with a proficiency of 80%.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 5.1 | The learner will orally identify the equipment used to form a sheet metal product.<br><br>1. bar fold<br>2. Box Pan Brake<br>3. sheet metal stakes<br>4. mallet<br>5. hand seamer | 5.1 | Orally identify the equipment used to form a sheet metal assembly. |
| 5.2 | Using the bar fold or hand seamer, the learner will hem all exposed edges on his sheet metal product. | 5.2 | Hem aall exposed edges of your sheet metal product using the bar fold or hand seamer. |
| 5.3 | Using the box and pan brake, form the ends and sides of sheet metal. | 5.3 | Form the ends and sides of the sheet metal material. |
| 5.4 | The learner will set all bends using a mallet and sheet metal stakes. | 5.4 | Set bends on sheet metal mallet and sheet metal stakes. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 5.0

INTERIM PERFORMANCE OBJECTIVE (5.1) - (5.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 5.1.1 | Recall sheet metal forming tools. | 5.1.1 | Orally recall the names of sheet metal forming tools and equipment. | 5.1.1 | Display<br>Equipment<br>Textbook<br>Demonstration | |
| 5.1.2 | Identify sheet metal forming tools. | 5.1.2 | Identify orally sheet metal forming tools. | 5.1.2 | Equipment<br>Demonstration | |
| 5.2.1 | Recall appropriate equipment ot to hem sheet metal. | 5.2.1 | Identify and give function of Bar Fold. | 5.2.1 | Demonstration<br>Equipment<br>Textbook | |
| 5.2.2 | Use appropriate equipment to hem edges of sheet metal product. | 5.2.2 | Correctly hem edges of sheet metal. | 5.2.2 | Equipment<br>Demonstration<br>Textbook | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 5.0

INTERIM PERFORMANCE OBJECTIVE (5.3) - (5.4)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 5.3.1 | Recall equipment used to form sheet metal. | 5.3.1 | Identify orally equipment by name and function. | 5.3.1 | Equipment<br>Box and Pan Brake | |
| 5.3.2 | Recall end forming of sheet metal. | 5.3.2 | Form ends of sheet metal. | 5.3.2 | Sheet Metal<br>Product | |
| 5.3.3 | Recall side forming of metal. | 5.3.3 | Form sides of sheet metal. | 5.3.3 | Sheet Metal<br>Product | |
| 5.4.1 | Recall the safe use of a mallet and and sheet metal stakes to set bends in sheet metal. | 5.4.1 | Identify sheet metal stakes by name and function. | 5.4.1 | Mallet<br>Sheet metal stakes | |
| 5.4.2 | Recall proper bending of sheet metal. | 5.4.2 | Physically set sheet metal bends. | 5.4.2 | Sheet metal product. | |

COURSE AMERICAN INDUSTRIES

MANUFACTURING

TERMINAL PERFORMANCE OBJECTIVE NO. 6.0 Finishing

The learner will identify, in writing with 60% proficiency, three (3) finishing methods and will prepare the surface and apply the proper finish to a sheet metal project.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 6.1 | The learner will identify three (3) finishing methods. | 6.1 | Match the three (3) kinds of finishing samples with the correct corresponding description.<br>Coating Sample B — A. Finishing by "cutting" of material from the surface.<br>Removal Sample A — B. Applying a layer of material to the surface.<br>Displacement Sample C — C. Finishing by moving surface material to a different position to form a new appearance or texture. |
| 6.2 | The learner will prepare the surface and apply a finish to sheet metal using one of the finishing methods given in 6.1 . | 6.2 | Prepare the surface of your sheet metal and select and apply -- the proper finish. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 6.0 INTERIM PERFORMANCE OBJECTIVE (6.1) - (6.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 6.1.1 | Recall finishing processes. | 6.1.1 | Orally state finishing processes. | 6.1.1 | Textbook<br>Lecture<br>Sample Finishes | |
| 6.1.2 | Identify three (3) kinds of finishing processes. | 6.1.2 | Match the description of finishes with samples of finishes. | 6.1.2 | Sample Finishes | |
| 6.2.1 | Recall correct procedure for applying finish. | 6.2.1 | Orally state the correct finishing procedure. | 6.2.1 | Demonstrations | |
| 6.2.2 | Finish product with one type of finish procedure specified by instructor. | 6.2.2 | Correct application of finish specified by instructor. | 6.2.2 | Sheet Metal Product<br>Emery cloth, steel wool<br>Spray or Brush Paint | |

COURSE AMERICAN INDUSTRIES

MANUFACTURING

**TERMINAL PERFORMANCE OBJECTIVE NO.** 7.0 Fastening

With 60% proficiency, the learner will, in writing, identify three (3) catagories of fastening and three (3) metal fasteners, and will demonstrate his ability to fasten metals.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 7.1 | The learner will identify, in writing, three (3) methods of metal fastening:<br><br>1. mechanical<br>2. adhesive<br>3. cohesive | 7.1.1 | Identify, in writing, three (3) methods of metal fastening. |
| 7.2 | The learner will, in writing, identify three mechanical fasteners:<br><br>1. rivet<br>2. bolt & nuts<br>3. screws | 7.2.1 | Correctly identify in writing three (3) mechanical fasteners. |
| 7.3 | Demonstrate the ability to fasten by mechanical and adhesive means. | 7.3.1 | Assemble your product using a selected mechanical fastener and adhesive fasteners. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 7.0

INTERIM PERFORMANCE OBJECTIVE 7.1) - (7.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 7.1.1 | Recall catagories of fastening. | 7.1.1 | Identify orally the catagories of fastening. | 7.1.1 | Lecture<br>Demonstration<br>Samples of fastening | |
| 7.1.2 | Identify three (3) catagories of fasteners. | 7.1.2 | List in writing the three (3) catagories of fastening. | 7.1.2 | Textbook | |
| 7.2.1 | Recall three (3) mechanical fasteners. | 7.2.1 | Identify orally three (3) mechanical fasteners. | 7.2.1 | Lecture<br>Samples<br>Textbook<br>Display | |
| 7.2.2 | Identify three (3) mechanical fasteners by name. | 7.2.2 | In writing, identify three (3) mechanical fasteners. | 7.2.2 | Display of Mechanical Fasteners | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 7.0

INTERIM PERFORMANCE OBJECTIVE 7.3

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 7.3.1 | Recall uses of mechanical fasteners. | 7.3.1 | Orally indicate where mechanical fasteners can be used to assemble product. | 7.3.1 | Product Parts<br>Sample Fasteners | |
| 7.3.2 | Assemble product with one type of mechanical fastener. | 7.3.2 | Correct assembly of product using mechanical fasteners. | 7.3.2 | Sheet Metal Product<br>Mechanical Fastener<br>Fastener Tools | |

COURSE AMERICAN INDUSTRIES

MANUFACTURING

TERMINAL PERFORMANCE OBJECTIVE NO. 8.0 Quality Control

The learner will identify, with 60% proficiency, the correct meaning of terms used in inspection and quality control and will perform a self evaluation of a manufactured product.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 8.1 | The learner will define the correct measuring for the following terms:<br>1. precision<br>2. inspection<br>3. quality control | 8.1.1 | Match the Description to the correct term, in writing.<br>1. precision<br>2. inspection<br>3. quality control<br>_____Very accurate or exact.<br>_____to set and keep standards for materials and products<br>_____looking at or measuring materials and products to see if they meet the standards. |
| 8.2 | The learner will evaluate, in writing, the qualities of his constructed product based on:<br>1. cutting<br>2. forming<br>3. fastening<br>4. finishing<br>5. workmanship | 8.2.1 | Evaluate your product and record the results using the five (5) standards of quality listed below:<br>1. cutting<br>2. forming<br>3. fastening<br>4. finishing<br>5. workmanship |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 8.0

INTERIM PERFORMANCE OBJECTIVE (8.1) - (8.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 8.1.1 | Recall the terms used in quality control. | 8.1.1 | Identify correct terms. | 8.1.1 | Textbook<br>Lecture | |
| 8.1.2 | Recall the meaning of quality control terms. | | Identify correct meanings. | 8.1.2 | Textbook<br>Lecture | |
| 8.2.1 | Recall standards of quality for their product:<br>1. cutting - no burrs, straight<br>2. forming - smooth and straight<br>3. fastening - fully applied tightly applied<br>4. finishing - smooth, uniform application of finish - good coverage<br>5. workmanship - unwarped smooth, uniform appearance. Correct measurement | 8.2.1 | Identify standards of quality. | 8.2.1 | Teacher Constructed "Standard" product scale<br>Size Gage | |
| 8.2.2 | Evaluate quality of product for each of five standards of quality. | 8.2.2 | Record your evaluation of each of five standards of quality. | 8.2.2 | Teacher Constructed "Standard" product scale<br>Size Gage | 40 |

COURSE AMERICAN INDUSTRIES

MANUFACTURING

TERMINAL PERFORMANCE OBJECTIVE NO. 9.0 — Mass Production

The learner will, in writing with 80% proficiency, demonstrate his understanding of mass production methods and will participate in mass production activities.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 9.1 | Given a list of terms, the learner will recognize, in writing those that apply to mass production:<br><br>Jig<br>Flow Chart<br>Materials<br>Assembly Line Production<br>Tooling-Up<br>Economy<br>Quality Control<br>In-Process Materials<br>Raw Materials | 9.1 | Underline the terms that apply directly to mass production from the list below:<br><br>Jig — Raw Materials<br>Activities — Tooling<br>Ferrous — Production<br>Flow Chart — Economy<br>Materials — Quality Control<br>Non-Ferrous — Football<br>Magnetic — Interview<br>Assembly Line — Florida<br>Product — In-Process Materials |
| 9.2 | Given a demonstration of mass production steps, the learner will generate a flow chart for the process. | 9.2 | Using the steps for manufacturing, draw a flow chart for the product to be manufactured. |
| 9.3 | The learner will orally identify four or more hand and power tools used to fabricate a mass produced product. | 9.3 | Orally name four or more hand or power tools used to fabricate a mass production product. |

COURSE AMERICAN INDUSTRIES
MANUFACTURING

TERMINAL PERFORMANCE OBJECTIVE NO. 9.0 Mass Production

(Cont.)

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 9.4 | Given a work station, the learner will participate in a mass production product. | 9.4 | Perform the manufacturing operations appropriate to the work station assigned to you. |
| 9.5 | Given experiences in custom and mass production, the learner will select statements appropriate to each process. | 9.5 | Identify statements below appropriate to custom production and label with a C and select statements appropriate to mass production and label with a P. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 9.0

INTERIM PERFORMANCE OBJECTIVE (9.1) - (9.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 9.1.1 | Identify terms used in mass production. | 9.1.1 | Recall orally terms used in mass production. | 9.1.1 | Textbook<br>Lecture | |
| 9.1.2 | Recognize terms used in mass prodution. | 9.1.2 | From a pre-printed list, underline the terms used in mass production. | 9.1.2 | Textbook<br>Lecture | |
| 9.2.1 | Observe and determine the time required for each mass production step needed to produce a simple product. | 9.2.1 | Record the name of step and time required for each step. | 9.2.1 | Lecture<br>Demonstration of mass production Steps<br>Tools, Fixtures | |
| 9.2.2 | Recognize a flow chart. | 9.2.2 | Identify orally a flow chart. | 9.2.2 | Flow<br>Textbook | |
| 9.2.3 | Recall the use of a flow chart as given in a teacher's lecture. | 9.2.3 | List the steps for production of product in a flow chart form. | 9.2.3 | Lecture<br>List of Steps from 9.2.1<br>Flow Chart Form | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 9.0

INTERIM PERFORMANCE OBJECTIVE (9.3)-(9.4)-(9.5)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 9.3.1 | Recall hand and power tools used to fabricate mass production product. | 9.3.1 | Orally recall the hand and power tools. | 9.3.1 | Teacher Demonstration<br>Hand and Power Tools | |
| 9.3.2 | Identify hand power tools used in mass production product. | 9.3.2 | Orally identify hand tools displayed | 9.3.2 | Demonstration<br>Hand Tools | |
| 9.4.1 | Recall the appropriate operation at work station assigned by teacher. | 9.4.1 | Perform operations correctly in a dry run following demonstration by instructor. | 9.4.1 | Dry Run<br>Demonstration by Teacher | |
| 9.4.2 | Participate in mass production product | 9.4.2 | Perform required operations at given work stations. | 9.4.2 | Fixtures, Tools<br>RawMaterials | |
| 9.5.1 | Recall characteristics of custom production. | 9.5.1 | Orally state characteristics of custom production. | 9.5.1 | Lecture<br>Review<br>Sample Products | |
| 9.5.2 | Recall characteristics of mass production. | 9.5.2 | Orally state characteristics of mass production. | 9.5.2 | Lecture<br>Review<br>Sample Products | |
| 9.5.3 | Identify characteristics of mass and custom production. | 9.5.3 | Identify statements appropriate to custom production with a P and those appropriate to mass production with a C . (See C. M. 9.5) | 9.5.3 | Lecture<br>Review | |

COURSE AMERICAN INDUSTRIES

MANUFACTURING

TERMINAL PERFORMANCE OBJECTIVE NO. 10.0

Occupations

The learner will research manufacturing occupations available in his community and with 80% proficiency identify, in writing, five (5) occupations relating to manufacturing.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 10.1 | The learner will research occupations available in his community | 10.1 | Circle an occupation in the classified section of a newspaper relating to manufacturing. |
| 10.2 | The learner will define, in writing one (1) occupational opportunity offered in industry. | 10;2 | Describe in writing the occupational opportunity selected in C.M. 10.1. State the following:<br>1. Training requirements<br>2. Working conditions<br>3. Salary or pay expected |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE . 10.1

INTERIM PERFORMANCE OBJECTIVE (10.1)-(10.2)

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 10.1.1 | Research occupations in manufacturing in local community. | 10.1.1 | Circle advertisements in the classified section of your local newspaper describing an opportunity in manufacturing. | 10.1.1 | Student supplied Classified Ads<br>Teacher Demonstration<br>Felt Tip Pens | |
| 10.1.2 | Recall five (5) occupations in your local community. | 10.1.2 | List in writing at least five (5) manufacturing occupation opportunities available in your community. | ? | Classified Ads | |
| 10.2.1 | Recognize one specific occupation in manufacturing | 10.2.1 | Select one (1) specific occupation in manufacturing. | 10.2.1 | Textbook<br>Newspaper<br>Guidance Resources<br>Media Center | |
| 10.2.2 | Research one (1) specific occupation in manufacturing and determine:<br>1. general job requirements<br>2. working conditions<br>3. salary or pay | 10.2.2 | Define in writing one (1) specific occupation in manufacturing and give information as to:<br>1. training requirements<br>2. working conditions<br>3. salary or pay | 10.2.2 | Textbooks<br>Newspapers<br>Guidance Resources<br>Media Center | |

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.160 - level 3-C)

Performance Objective No. 1.0
Intermediate Objective No. 1.1 CLASSIFICATION OF METALS

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Define in writing the following terms:

1. Ferrous
2. Non-Ferrous
3. Alloy

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING
(x 4.160 - level 3 - C )

Performance Objective No. 1.0
Intermediate Objective No. 1.2 CLASSIFICATION OF METALS

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Identify the six (6) metal samples displayed by the teacher and write name of sample on blackboard.

LEARNING PACKAGE

AMERICAN [illegible]STRIES

MANUFACTURING

(x 4.169 - level 2-D)

Performance Objective No. 1.0
Intermediate Objective No. 1.3 CLASSIFICATION OF METALS

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using the magnet provided by the teacher, separate the metal samples displayed by the teacher into ferrous and non-ferrous classifications.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING
(x 4.160 - level 3-C)
(x 4.169 - level 2-D)

Performance Objective No. 1.0 CLASSIFICATION OF MATERIALS
Intermediate Objective No. 1.4

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

After a demonstration by instructor on the visual identification of metals by spark test, conduct a spark test on several pieces of steel to determine the carbon content of each.

Record your results as follows for sample No. 1, 2, 3, etc.

| | HIGH CARBON STEEL | LOW CARBON STEEL |
|---|---|---|
| Sample No. | _____ | _____ |
| | _____ | _____ |
| | _____ | _____ |

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.168 - level 2-A)
(x 4.170 - level 2-C)

Performance Objective No. 2.0
Intermediate Objective No. 2.2 LAYOUT

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Tools Required:

Scratch Awl
Center Punch
12 inch Rule
Hammer
(2) Teacher Supplied Templates

Material Required

6 inch x 14 inch 26 gage sheet metal
1/4 x 1 x 5 1/2 wood or plastic clip stock

Steps

1. Listen and observe teacher's demonstration of the use of Layout tools to make a layout of your custom produced product.

2. When it is your turn to use the base template place it over the sheet metal stock, align it carefully along all edges and hold it firmly in place.

3. Using the scratch awl in the way you were instructed, scratch the shape of the notches onto the sheet metal (be careful not to let the template move).

4. While holding the base template in place, center punch the sheet metal through the two locating holes in the template.

5. Remove the base template from the sheet metal and pass it to the next student.

6. Position a 12 inch rule with its edge aligned between the notches at A and B as shown in the drawing. Scratch a line between the points or the notches at A and B and then also between C and D.

Performance Objective No. 2.0
Intermediate Objective No. 2.2 LAYOUT

(Cont.)

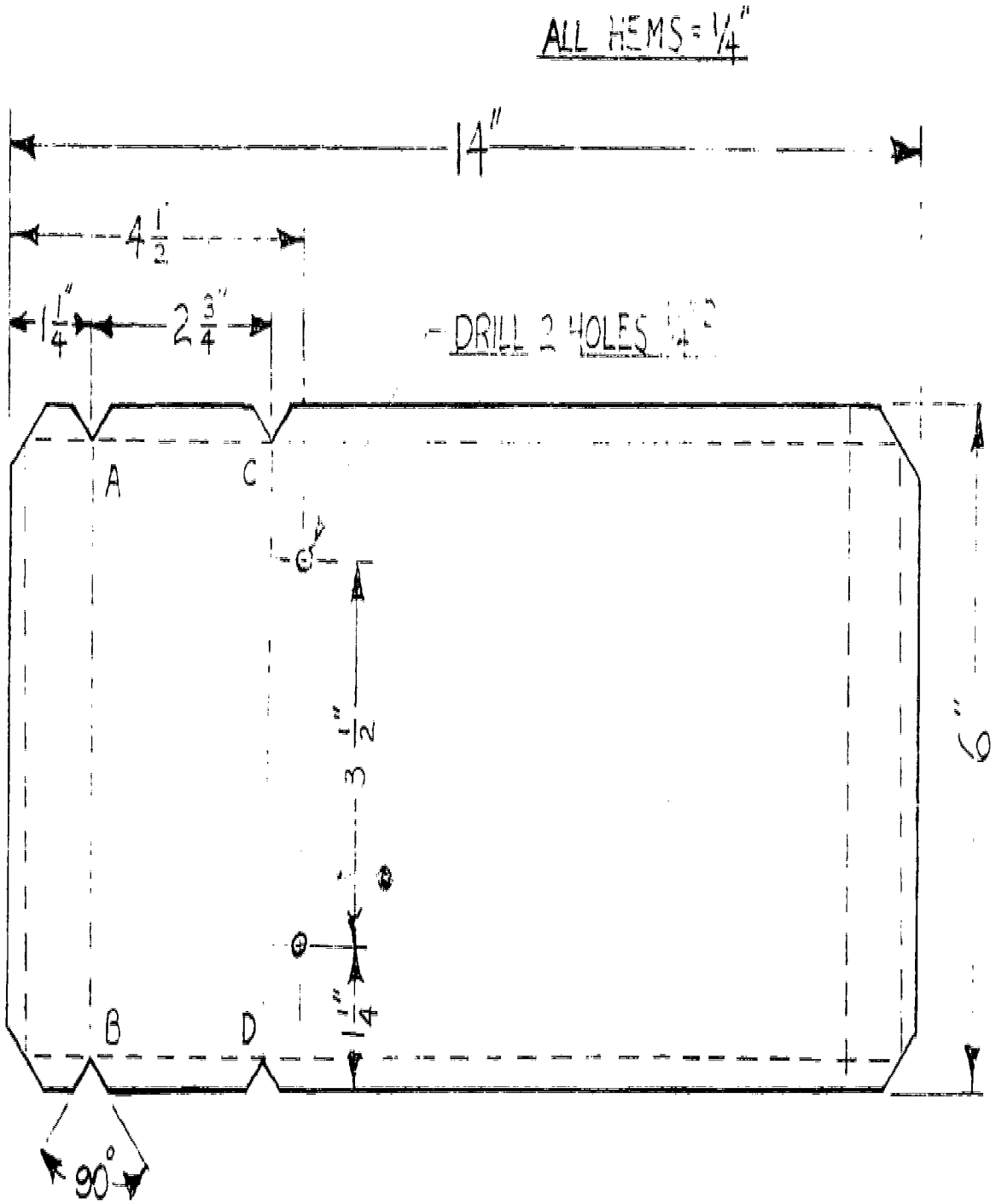
Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

7. Place the clip template over the supplied plastic or wood clip stock.
8. While holding clip template in place, center punch through holes (2) in template onto plastic or wood clip.
9. Pass the clip template to the next student .
10. You have now completed the layout for your product, listen carefully for the teacher's next instruction.

Safety Notes:

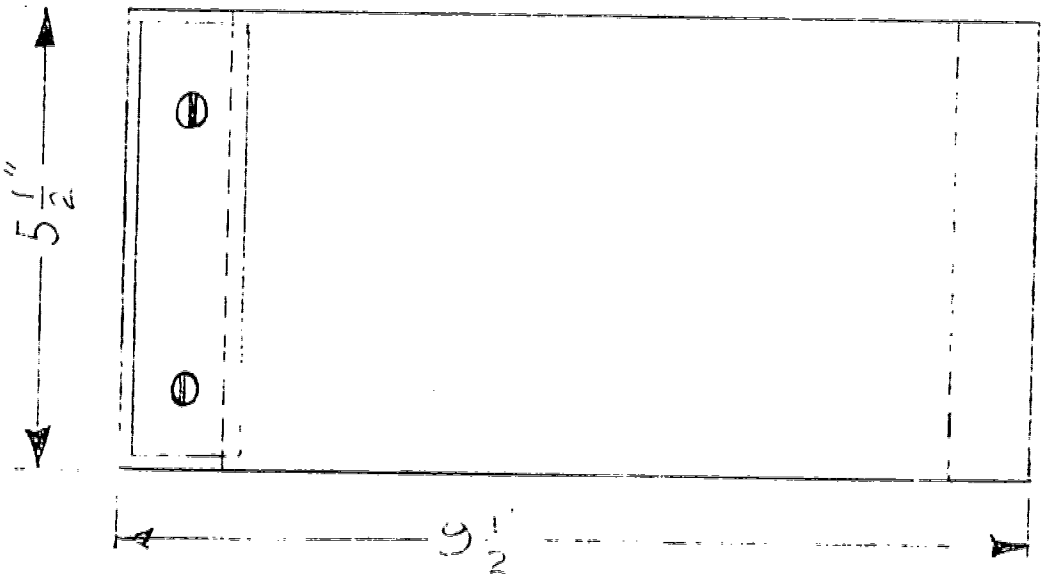
1. Wear your safety glasses.
2. Sheet metal edges have razor sharp burrs; be careful in handling.
3. The scratch awl is also sharp.
4. Observe laboratory rules of conduct and safety.

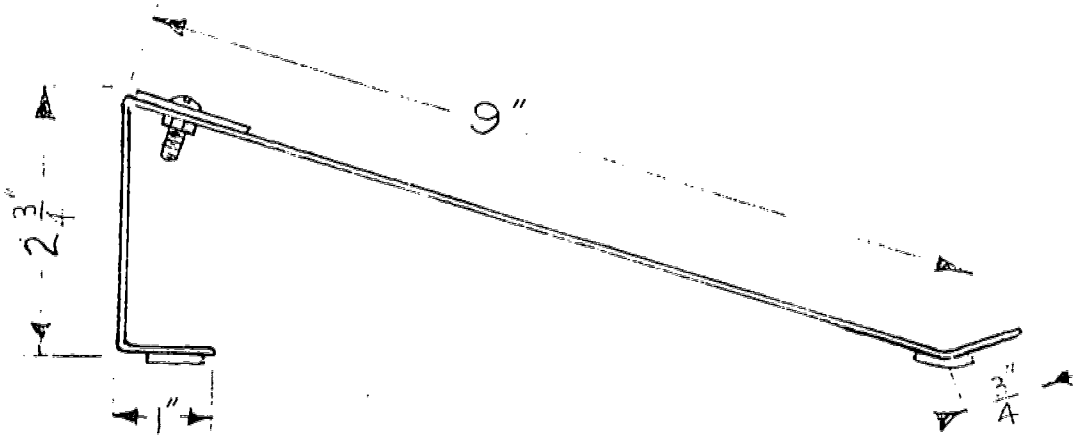



# TEMPLATE

SCALE 1/2 = 1"

# MEMO PAD HOLDER ASS'Y






SCALE 1/2" = 1"

M-96

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.161 - level 1-C)
(x 4.162 - level

Performance Objective No. 3.0
Intermediate Objective No. 3.1 CUTTING

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

From a display, orally identify the hand tools used to cut sheet metal.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.161 - level 1-C)
(x 4.168 - level 2-A)

Performance Objective No. 3.0 CUTTING
Intermediate Objective No. 3.2

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using appropriate sheet metal snips, cut out the sheet metal part that you have previously laid out.

Safety Notes

1. Use Safety glasses.
2. Sheet metal parts are sharp!
3. Use only files which have handles.

Steps

1. Listen to and watch teacher's demonstration on how to cut and de-burr your part.
2. Using the tin snips or aviation snips cut the notches you previously layed out at locations labeled A, B, C and D. Also cut the four (4) corners as marked.
3. You have now completed the cutting operations, listen carefully for the teacher's next instruction.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.161 - level 1-C)
(x 4.168 - level 2-A)

Performance Objective No. 3.0
Intermediate Objective No. 3.3

CUTTING

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Using a file and abrasive material, remove all burrs and sharp edges from the sheet metal base.

Listen carfeully for your teacher's next instruction.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.161 - level 1-C)
(x 4.164 - level 2-C)

Performance Objective No. 4.0
Intermediate Objective No. 4.2 DRILLING

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using the appropriate tools, locate and drill two (2) holes in your sheet metal part and drill two (2) holes in the clip and deburr the holes.

Safety Notes

1. Use safety glasses.
2. Sheet metal parts are sharp!
3. Secure clamp sheet metal when drilling.
4. Always unplug electric drill before inserting or removing drill unit.
5. Always remove chuck key from the drill chuck!

Steps

1. Listen and watch teacher's demonstration of how to drill the sheet metal base wood or plastic clip.

2. Place the sheet metal base onto a woodscrap about the size of the base and clamp the pieces into a vise with the sheet metal facing you.

3. Unplug the electric hand drill, insert the 1/4 inch diameter twist drill, insert into the chuck and tighten the chuck with the chuck's key -- Remove the chuck key!

4. Place the drill at one of the two holes centerpunched on the sheet metal base and drill through using the techniques demonstrated by the teacher. Repeat operation at the other hole.

Performance Objective No. 4.0
Intermediate Objective No. 4.2

DRILLING
(Cont.)

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

5. The sheet metal base can now be removed and the holes de-burred by the method shown to you by the teacher.

6. Place the plastic or wood clip into the vise with one of the centerpunched holes projecting above the vise. Drill a 1/4 inch diameter hole through the clip, reverse the clip in the vise and drill the hole in the other end.

7. Remove the clip from the vise and de-burr the hole by the method shown to you by the teacher.

8. Unplug the electric drill motor and remove the drill from the chuck using the chuck key.

LEARNING PACKAGE

AMERICAN INDUSTRIES

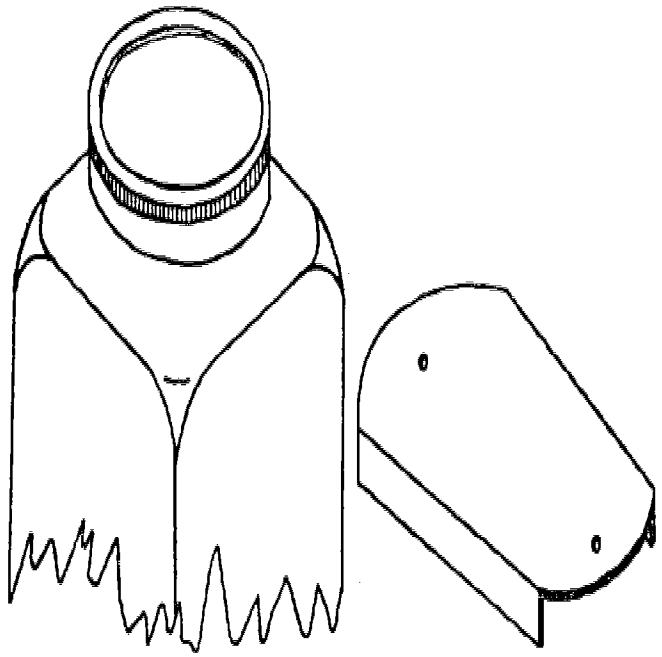
MANUFACTURING
(x 4.158 - level 2-A)

Performance Objective No. 5.0
Intermediate Objective No. 5.2 Forming

Source of your information _____
Author _____
Edition date _____

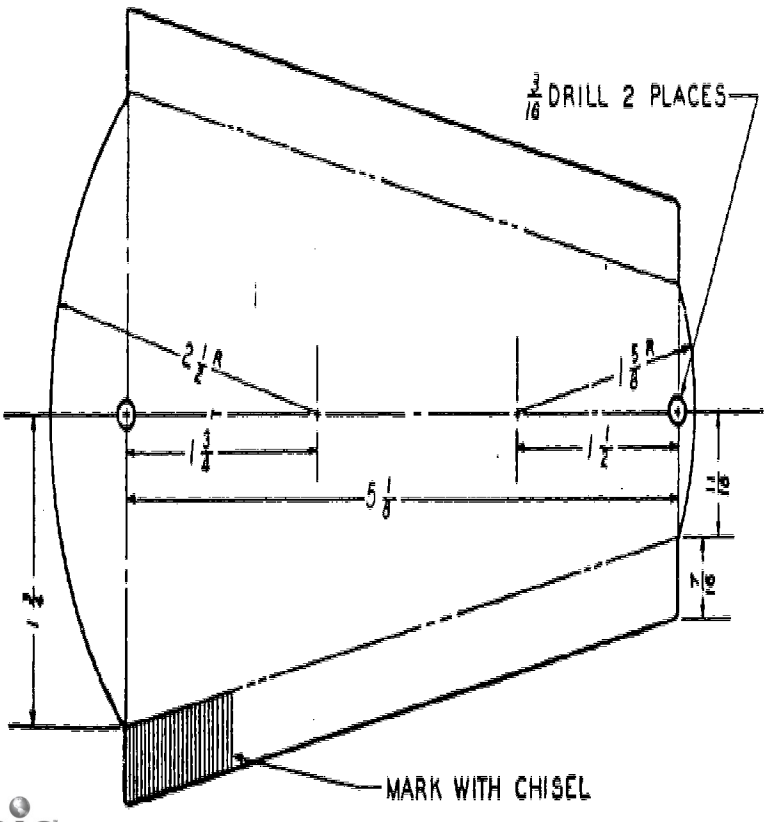
(Do not write on this sheet)

Using the method demonstrated by your instructor set the bar folder or hand seamer at 1/4 inch, hem all exposed edges of your sheet metal product using the bar folder or hand seamer.



# Jar Opener

Material Required:
1 piece #18 gauge black iron, 4½ x 6




Procedure:

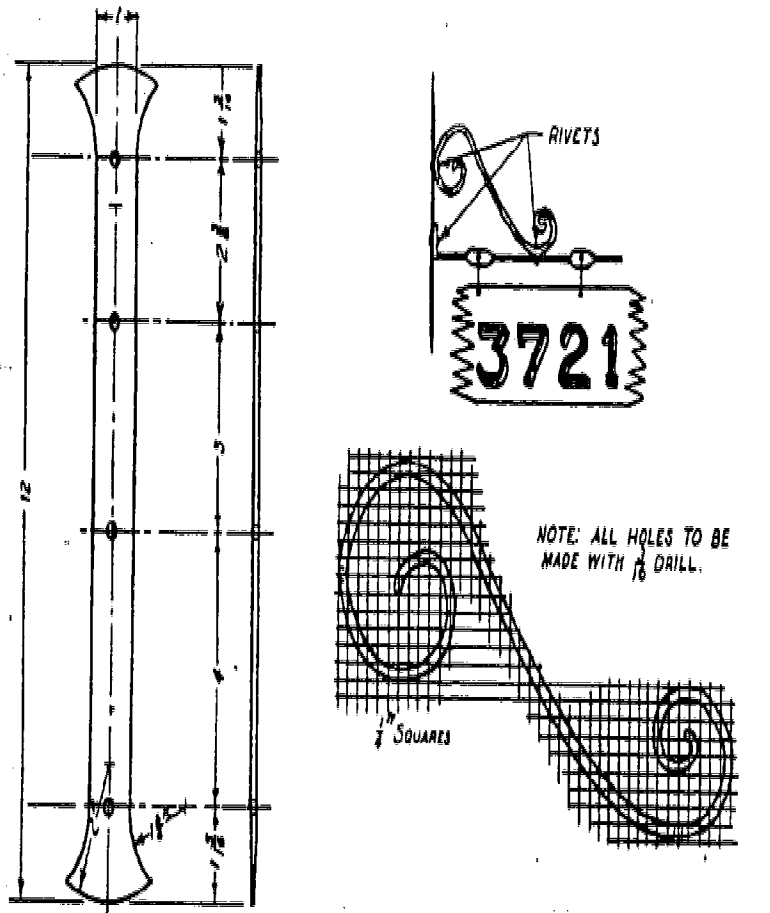
1. Get out stock.
2. Lay out.
3. Cut to size.
4. Center punch for holes.
5. Drill holes.
6. File edges smooth.
7. Mark edges as shown with chisel.
8. Fold edges at 90 degree angle.
9. Finish with emery cloth and steel wool.
10. Lacquer in color.





JAR OPENER

# House Marker



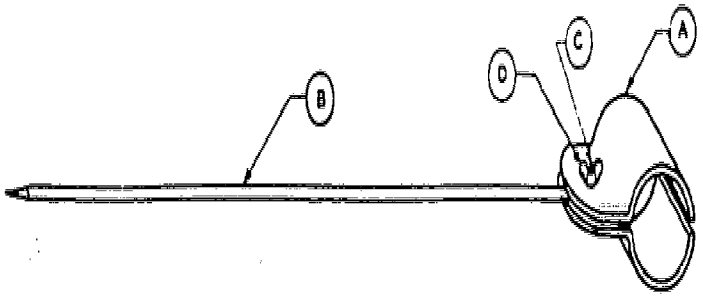

HOUSE MARKER

**Materials Required:**

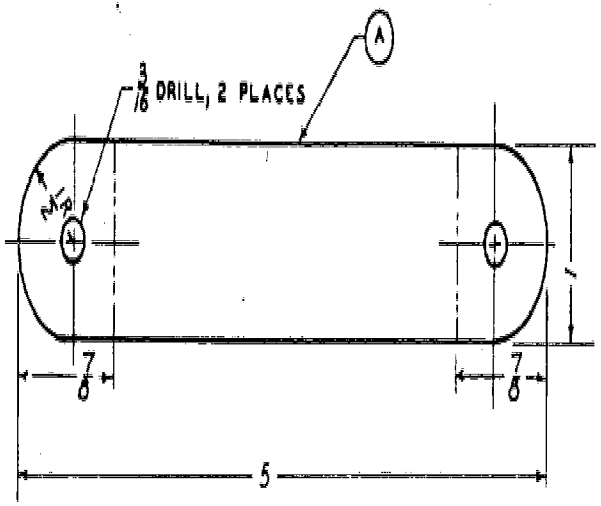
1 piece band iron, $\frac{1}{8}$ x $\frac{1}{2}$ x 24
1 piece band iron, $\frac{1}{8}$ x $\frac{1}{2}$ x $14\frac{1}{2}$
1 piece band iron, $\frac{1}{8}$ x 1 x $11\frac{1}{2}$
1 piece #24 gauge black iron, 5 x 15
3 rivets, S.I., R.H., $\frac{3}{16}$ x $\frac{1}{2}$
house numbers, as required

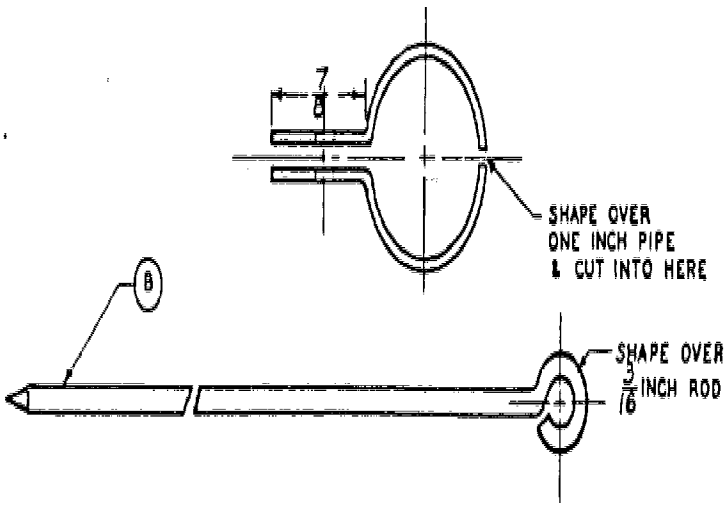
**Procedure:**

1. Get out stock and cut to size.
2. Lay out pattern for scroll.
3. Shape ends of scroll and back piece.
4. Shape scrolls.
5. Shape arm by bending and twisting.
6. Lay out the holes.
7. Center punch and drill.
8. Assemble by riveting.
9. Check.
10. Lay out the number pieces.
11. Cut to shape desired.
12. Lay out numbers.
13. Mark for holes.
14. Drill for numbers.
15. Lacquer or paint as desired.
16. Rivet numbers to piece.
17. Assemble to hanger with rings.




# Hose Holder



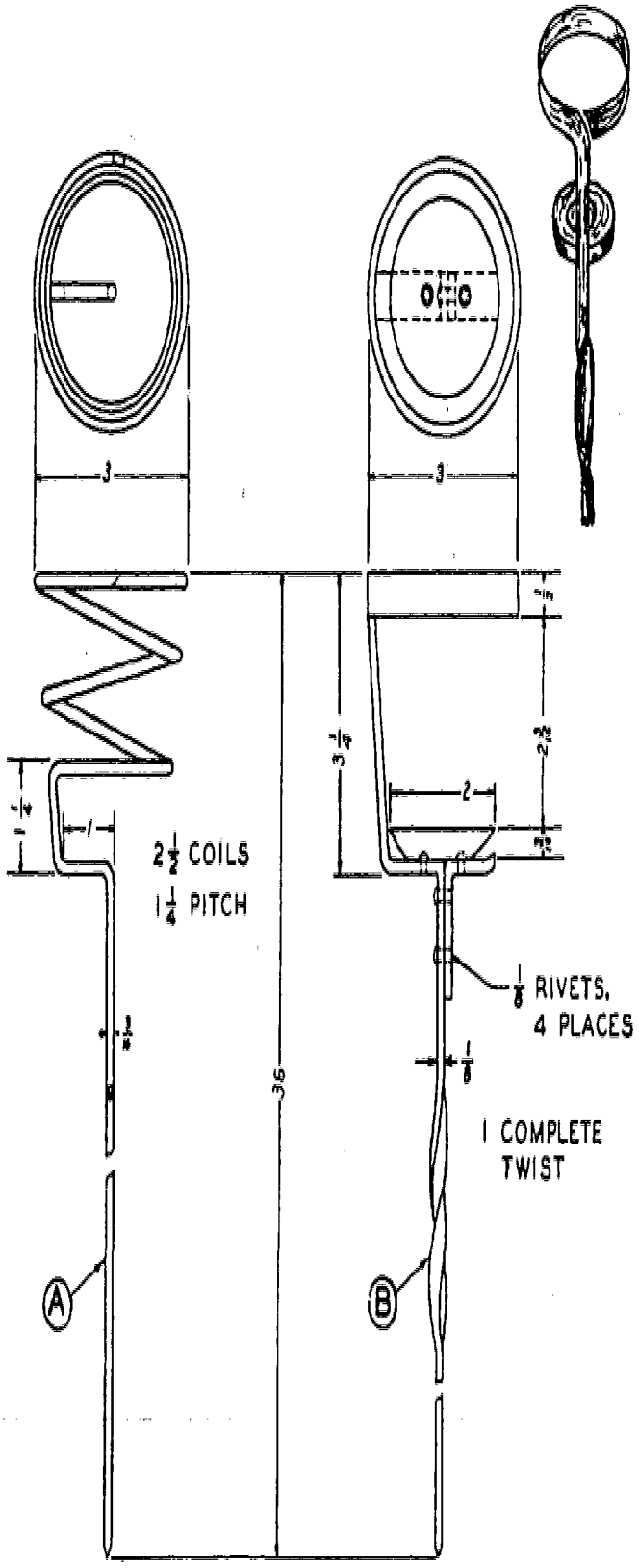

HOSE HOLDER

**Material Required:**

1 piece round mild steel rod, $\frac{3}{16}$ x 14
1 piece #18 gauge black iron, 1 x 5
1 stove bolt, round head, $\frac{3}{16}$ x $\frac{3}{4}$
1 wing nut, $\frac{3}{16}$

**Procedure:**

1. Get out stock.
2. Lay out holder (A).
3. Cut to size.
4. Drill holes.
5. Shape ends.
6. Finish.
7. Bend to shape over 1" pipe and with vise.
8. Cut through center, as shown.
9. Smooth with file.
10. Get out rod for upright.
11. Heat and shape eye.
12. File end for point.
13. Assemble.
14. Check.
15. Paint or finish as desired.




LAWN GLASS HOLDERS

# Lawn Glass Holder

Material Required:

Holder (A): 1 piece round iron rod, $\frac{3}{16}$ or $\frac{1}{4}$ x 65

Holder (B): 1 piece band iron, $\frac{1}{8}$ x $\frac{1}{2}$ x 52

1 piece band iron, $\frac{1}{8}$ x $\frac{1}{2}$ x $2\frac{1}{4}$

1 piece #22 gauge black iron, 2 dia.

2 rivets, soft iron, round heads, $\frac{1}{8}$ x $\frac{3}{8}$

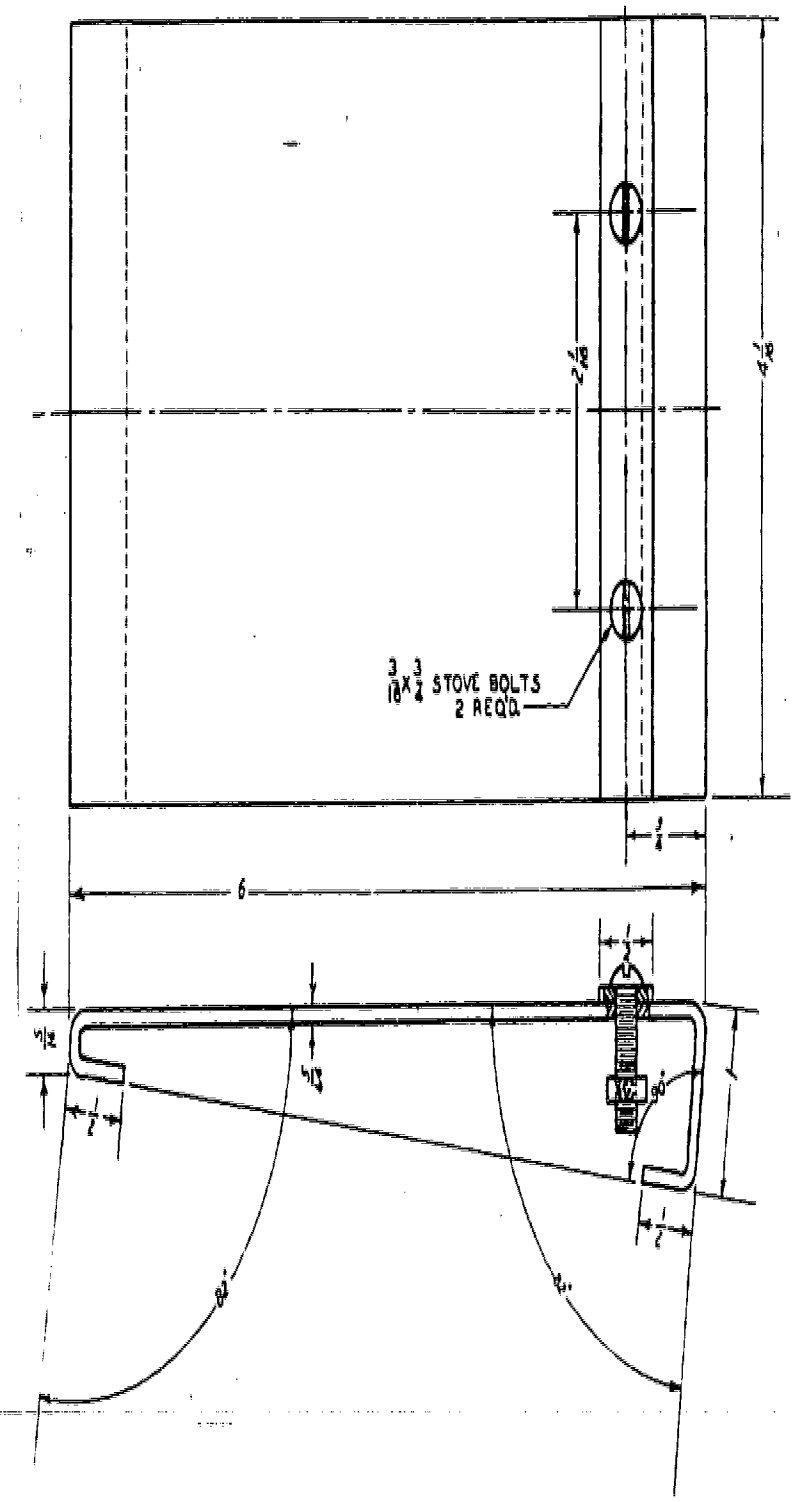
Procedure:

*Holder B*

1. Get out stock.
2. Shape top to 3" dia.
3. Heat and bend at right angles.
4. Lay out the bends.
5. Bend to shape.
6. Lay out the bracket.
7. Bend to shape.
8. Lay out the holes.
9. Drill $\frac{1}{8}$" holes.
10. Assemble bracket to upright.
11. Rivet bracket to upright.
12. Rivet bottom to bracket.
13. Twist upright one turn.
14. Sharpen end.
15. Check holder.
16. Finish with emery cloth.
17. Lacquer desired color.

*Holder A*

1. Cut stock to length.
2. Flatten coil end; smooth.
3. Start scroll over 3" pipe.
4. Clamp scroll to pipe.
5. Make $2\frac{1}{2}$ coils.
6. Remove from pipe.
7. Stretch out coils to shape.
8. Lay out the bends.
9. Bend to shape.
10. Sharpen end.
11. Check holder.
12. Finish with emery cloth.
13. Lacquer desired color.




Material Required:

1 piece aluminum, .051 x $4\frac{1}{16}$ x $8\frac{1}{2}$
1 piece aluminum, .051 x $\frac{1}{2}$ x $4\frac{1}{16}$
2 stove bolts, R. H., $\frac{3}{16}$ x 1
1 memo pad, 4 x 6

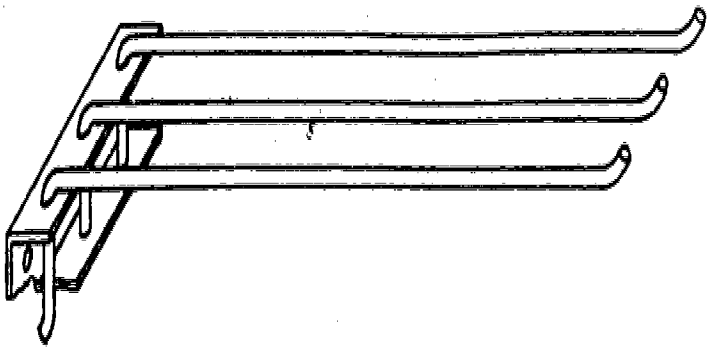
Procedure:

1. Get out stock for holder and top strip.
2. Smooth edges.
3. Lay out the holes.
4. Lay out the bends.
5. Drill $\frac{4}{16}$" holes.
6. Make bends.
7. Polish pieces with buffer.
8. Drill or punch holes in paper pad.
9. Assemble pad, holder and top strip.

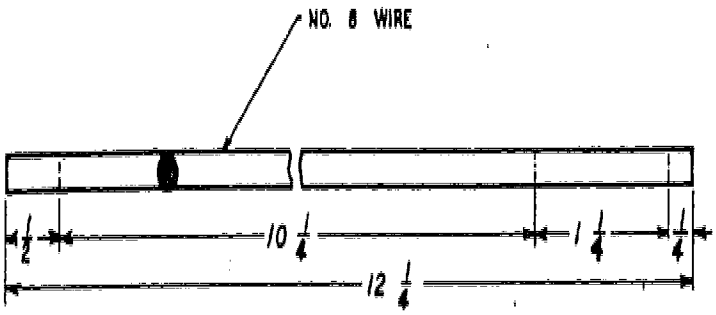




# MEMO PAD HOLDER

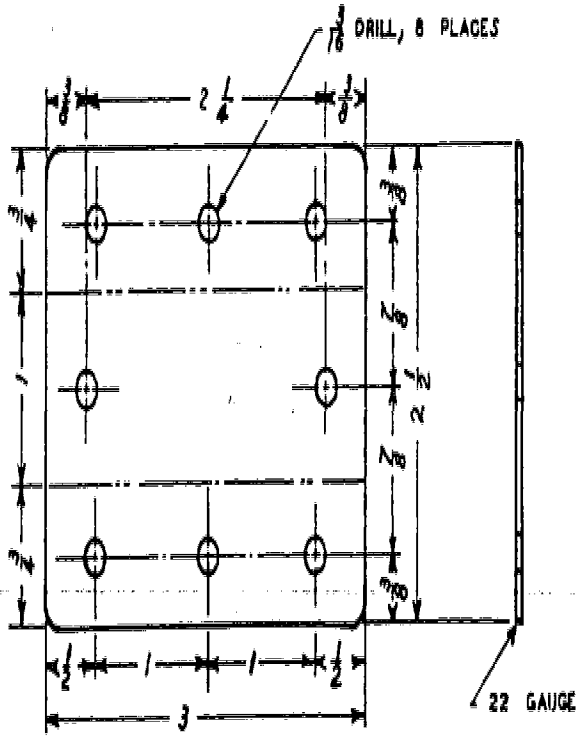


# Towel Rack




Material Required:

1 piece #22 gauge black iron, 2½ x 3
3 pieces #8 galvanized wire, 12¼ (or $\frac{3}{16}$ round iron rod)



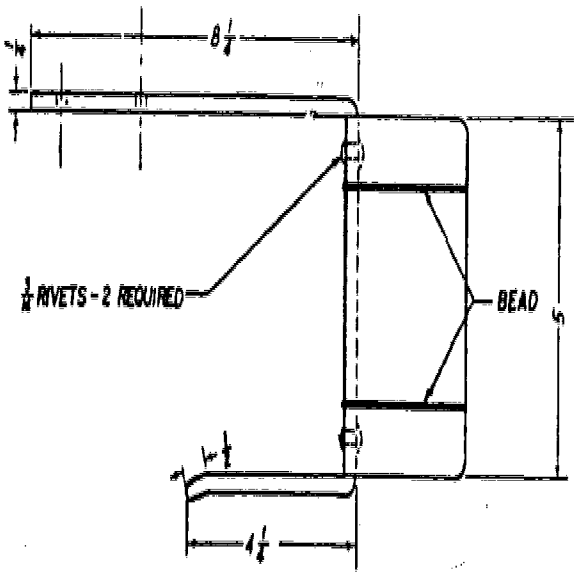

Procedure:

1. Lay out holder and cut to size.
2. Center punch and drill the $\frac{3}{16}$" holes.
3. Bend at right angles on the dotted lines.
4. Align holes.
5. Cut to length, #8 wire 12¼" long.
6. Smooth the ends with a file and round corners.
7. Bend to shape in the vise with a hammer.
8. Smooth with emery cloth.
9. Assemble.
10. Finish with emery cloth.
11. Lacquer desired color.





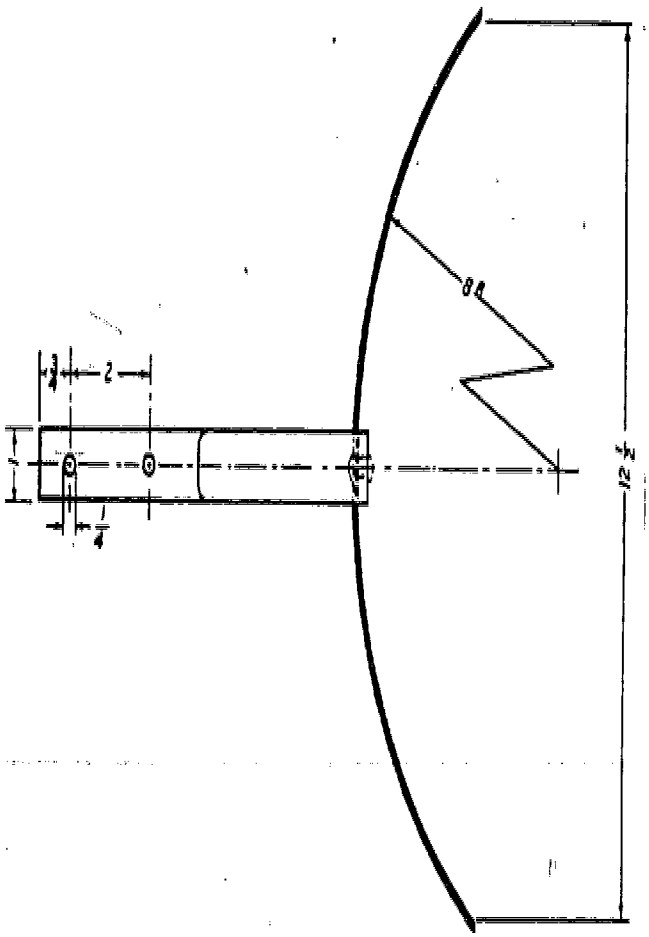
TOWEL RACK




# Garden Hose Holder

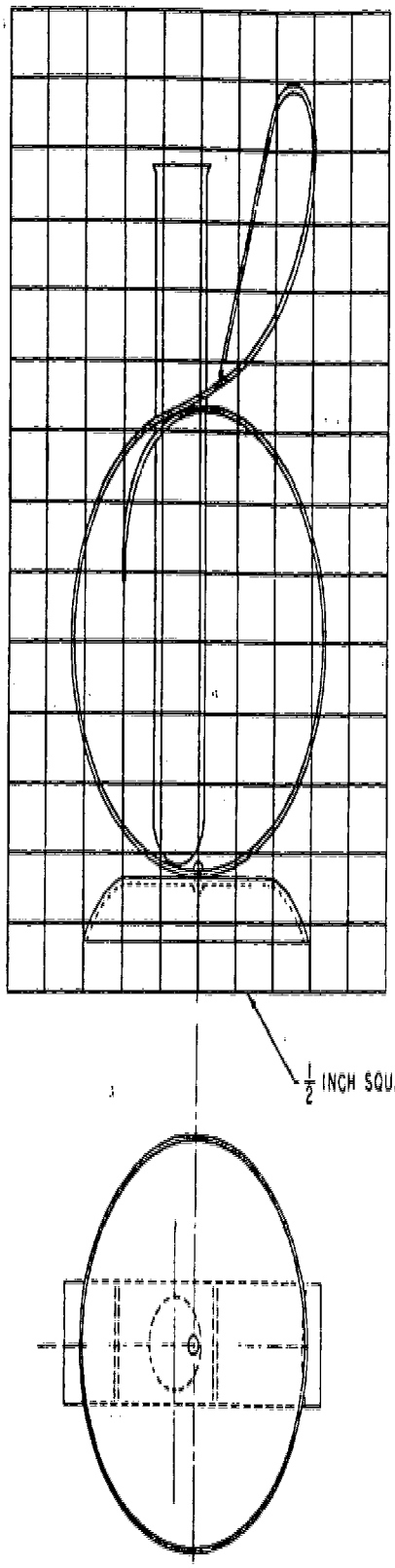
Material Required:

1 piece band iron, $\frac{1}{4}$ x 1 x 18
1 piece #16 gauge black iron, 5 x 14$\frac{1}{2}$
2 rivets, S.I., R.H., $\frac{3}{16}$ x $\frac{1}{2}$




Procedure:

1. Read print.
2. Get out stock for bracket.
3. Cut to size.
4. Lay out the holes.
5. Lay out the bend.
6. Drill holes.
7. Bend and shape.
8. Get out 16 ga. black iron.
9. Cut to size.
10. Lay out the holes.
11. Drill.
12. Shape as shown, on slip roll.
13. Run bead for reinforcement.
14. Assemble pieces by riveting.
15. Finish with file and emery cloth.
16. Paint and lacquer.




FLOWER BUD HOLDER

# Flower Bud Holder

Material Required:

1 piece aluminum, .051 x 3½ dia.
1 piece aluminum, .032 x 1 x 18½
1 test tube, ¾ dia.
1 rivet, aluminum, ⅛ x ½

Procedure:

1. Get out stock.
2. Cut metal for base (3½" circle).
3. Shape by hammering or pressing.
4. Lay out the scroll.
5. Get out stock for scroll.
6. Drill holes for test tube and rivet.
7. Peen surfaces of base and scroll piece.
8. Form to shape.
9. Rivet scroll to base.
10. Check.
11. Finish with steel wool and polish.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING
(x 4.168 - level 2-A)

Performance Objective No. 5.0
Intermediate Objective No. 5.3 FORMING

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

1. Using the method demonstrated by your teacher and a box and pan brake fold, fold your sheet metal base on the bend line A - B to a 90° angle to obtain the shape below:

2. Now bend along bend line C - D to obtain the shape below:

3. Insert the pencil tray end of the base 3/4 inch into the box and pan brake and bend the edge to the shape shown below:

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.168 - level 2-A)

Performance Objective No. 5.0
Intermediate Objective No. 5.4 FORMING

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using the method demonstrated by your teacher and a mallet and sheet metal stake, set all bends on your note pad holder.

You have completed the forming operations on your note pad holder, listen carefully for the next instructions from your teacher.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.168 - level 2-A)

Performance Objective No. 6.0

Intermediate Objective No. 6.1 FINISHING

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Match the three (3) samples of finishing methods displayed by the teacher with the description of finishing methods below:

Sample Number and Name

_____ This finishing method envolves "cutting" of material from the surface.

_____ This finishing method envolves applying a layer of material to the surface.

_____ Finishing with this method consists of moving the surface of the material from one location to another.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.168 - level 2-D)

Performance Objective No. 6.0
Intermediate Objective No. 6.2 FINISHING

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

FINISHING -

Steps

1. Observe your teacher demonstrate the cleaning and coating processes of the product.
2. Using steelwool to clean metal product.
3. Apply a coat of paint to finished assembly.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING
(x 4.160 - level 3-C)

Performance Objective No. 7.0
Intermediate Objective No. 7.1 FINISHING

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Identify, in writing, the three (3) catagories of fastening discussed by the teacher.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.160 - level 3-C)

Performance Objective No. 7.0 FASTENING

Intermediate Objective No. 7.2

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Identify at least three (3) mechanical fasteners from the samples displayed by the teacher.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.168 - level 2-D)

Performance Objective No. 7.0

Intermediate Objective No. 7.3 FASTENING

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Assemble your product by attaching the clip and pre-punched pad of paper (punched by the teacher) to the base with threaded mechanical fasteners. Assemble the felt feet to the bottom of the base with adhesive.

Steps

1. Listen carefully to the teacher's instructions on how to fasten the parts of your product together and attach the felt to the base.
2. Align the holes in the pre-punched pad with the holes in the clip.
3. Insert two inch long round head machine screws into the holes in the clip and through the paper.
4. Insert the screws into holes into the base.
5. Holding the screw heads so that they do not fall out, turn the base over so the ends of the screws are exposed.
6. Place a lock washer over each screw and start a wing nut or hex nut onto each screw; tighten them hand tight.
7. Place four felt pads obtained from your teacher on a small piece of paper.

Performance Objective No. 7.0 FASTENING
Intermediate Objective No. 7.3 (Cont.)

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

8. Your teacher will show you how to mix one drop of epoxy resin and one drop of hardner on a small piece of aluminum foil using a tooth pick to stir the two liquids together.

9. Place a very small quantity of the mixed adhesive on each felt pad.

10. With the assembled note pad holder inverted, adhere the felt pads on each corner of the base.

11. Listen carefully for further instructions from your teacher.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.173 - level 2-F)

Performance Objective No. 8.0
Intermediate Objective No. 8.1 (Quality Control)

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Match the terms below to the correct description:

| | | |
|---|---|---|
| A. | Precision | _____ Very accurate or exact. |
| B. | Inspection | _____ To set and keep standards for materials and products. |
| C. | Quality Control | _____ Looking at or measuring materials and products to see if they meet the standards. |

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING
(x 4.172 - level 1-B)
(x 4.171 - level 2-G)

Performance Objective No. 8.0
Intermediate Objective No. 8.2 QUALITY CONTROL

Source of your information

Author _____

Edition date _____

(Do not write on this sheet)

Evaluate your product and record the results using the five (5) standards of quality listed below:

1. cutting _____
2. forming _____
3. fastening _____
4. finishing _____
5. workmanship _____

A = excellent quality

B = good quality

C = average quality

D = poor quality

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.161 - level 2-G)
(x 4.167 - level 1-C)

Performance Objective No. 9.0
Intermediate Objective No. 9.1 MASS PRODUCTION

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Underline the terms below which apply directly to mass production:

| | |
|---|---|
| jig | raw materials |
| activities | tooling |
| ferrous | production |
| flow chart | economy |
| materials | quality control |
| magnetic | football |
| assembly line | interview |
| product | interview |
| Florida | in-process materials |

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.170 - level 2-C)
(x 4.163 - level 3-C)

Performance Objective No. 9.0
Intermediate Objective No. 9.2

MASS PRODUCTION

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

List the steps required to produce the mass produced product and record the time required for each step.

| Production Step | TIME REQUIRED |
|---|---|

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.170 - level 2-C)
(x 4.163 - level 3-C)

Performance Objective No. 9.0
Intermediate Objective No. 9.2 MASS PRODUCTION

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

List the steps for production of the product on the flow chart form provided.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.173 - level 2-F)

Performance Objective No. 9.0
Intermediate Objective No. 9.5

MASS PRODUCTION

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Identify statements below appropriate to custom production and label with a C and select statements appropriate to mass production and label with a P.

C Products made usually by one or two workers.

P Products all look exactly alike.

C Some of these products may be slightly different.

C Products usually made in small quantities.

P Jigs and fixtures are usually used for manufacturing.

C An Indianapolis 500 race car is an example.

P A Honda 750 bike is an example.

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.167 - level 1-C)

Performance Objective No. 10.0
Intermediate Objective No. 10.1 OCCUPATIONS

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Circle advertisements in the classified section of your local newspaper describing opportunities in manufacturing. Your teacher will provide you with a page from the classified section and a felt tip pen.

List at least five (5) of the employment opportunities available in your community below:

1. _____
2. _____
3. _____
4. _____
5. _____

LEARNING PACKAGE

AMERICAN INDUSTRIES

MANUFACTURING

(x 4.167 - level 1-E)

Performance Objective No. 10.0
Intermediate Objective No. 10.2 OCCUPATIONS

Source of your information _____

Author _____

Edition date _____

(Do not write on this sheet)

Select one specific occupation from the listings in your textbook or newspaper, and research the training requirements, working conditions, and salary or pay. Define these in writing.

You may be able to get the required information from the guidance department or media center at your school, or you may be able to interview a relative or neighbor about their job.

AMERICAN INDUSTRIES

Graphic Communication

COURSE AMERICAN INDUSTRIES
(Graphic Communication)

TERMINAL PERFORMANCE OBJECTIVE NO. 1.0 — Introduction

The learner will, with 80%accuracy, write the laboratory responsibilities expected of him and will orally demonstrate his knowledge of the grading procedures used in this course of study.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 1.1 | The learner will write and define the responsibilities expected of him in the General Graphics Communications Laboratory:<br>1.) Punctuality<br>2.) Citizenship<br>3.) Safety<br>4.) Behavior<br>5.) Good Housekeeping | 1.1.1 | Write and define five (5) areas of responsibility expected of you. |
| 1.2 | The learner will orally recall the following areas to be graded in this course of study.:<br>1.) Projects<br>2.) Tests<br>3.) Written Work (other than tests)<br>4.) Daily Performance | 1.2.1 | Orally state the four (4) areas to be considered in measuring your classroom performance. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 1.0 INTERIM PERFORMANCE OBJECTIVE 1.1

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 1.1.1 | Recall the five (5) areas of responsibility expected of you in the graphics area. | 1.1.1 | Write the five (5) areas of responsibility expected of you in the graphics area. | 1.1.1 | Lecture Demonstration | |
| 1.1.2 | Recall the definitions of the five (5) areas of responsibility of the graphics laboratory. | 1.1.2 | In writing, define the five (5) areas of responsibility expected of you in the graphics area. | 1.1.2 | Lecture Demonstration | |

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FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 1.0

INTERIM PERFORMANCE OBJECTIVE 1.2

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 1.2.1 | Recall, orally, the four (4) areas to be considered in measuring your performance in the graphics area. | 1.2.1 | Orally define the four (4) areas to be considered in measuring your performance in the graphics areas. | 1.2.1 | Lecture<br>Demonstration<br>School Policy Handbook | |
| 1.2.2 | Recall the definition of the four (4) areas considered in determining a grade. | 1.2.2 | Orally define the four (4) grading factors. | 1.2.2 | Lecture<br>Demonstration<br>School Policy Handbook | |

COURSE AMERICAN INDUSTRIES

Graphic Communications

TERMINAL PERFORMANCE OBJECTIVE NO. 2.0

Occupations

The learner will, with 75% proficiency, list (in writing) and orally define twelve (12) areas of specialization available in the field of Graphic Communications.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 2.1 | The learner will demonstrate his knowledge of occupational opportunities within the field of Graphic Communications by listing the following areas of specialization:<br>1.) Photographers<br>2.) Typesetter-Hand<br>3.) Proofreaders<br>4.) Make-Up<br>5.) Salesman<br>6.) Photo-Engravers<br>7.) Pressman<br>8.) Binders<br>9.) Compositor<br>10.) Strippers<br>11.) Platemakers<br>12.) Typesetter-Machine | 2.1 | List, in writing, and orally define twelve (12) areas of specialization in the field of Graphic Communications. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 2.0 INTERIM PERFORMANCE OBJECTIVE 2.1

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REC |
|---|---|---|---|---|---|---|
| 2.1.1 | Recall twelve (12) areas of specialization in the field of Graphic Communications. | 2.1.1 | Write twelve (12) areas of occupational opportunities available in Graphic Communications. | 2.1.1 | Media Center<br>Textbook<br>Lecture | |
| 2.1.2 | Recall job descriptions of the twelve (12) areas of specialization listed in learning step 3.1.1. | 2.1.2 | In writing, describe the job requirements expected in each of the twelve (12) areas of specialization given in I.P.O. No. 3.1. | 2.1.2 | Media Center<br>Textbook<br>Lecture | |

COURSE AMERICAN INDUSTRIES

TERMINAL PERFORMANCE OBJECTIVE NO. 3.0 — Printing

(Cont.)

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 3.1 | Identify a pilot press and its major components.<br>1.) Platen<br>2.) Hand Lever<br>3.) Ink Disc<br>4.) Chase Clamp | 3.1 | Orally identify a pilot press and name its major components. |
| 3.2 | Given a composing stick and type of all capital letters, set type. | 3.2 | Set your name in capital letter type in a composing stick. |
| 3.3 | Identify a chase. | 3.3 | Orally identify a chase and observe the instructor lock your type in the chase. |

COURSE AMERICAN INDUSTRIES

TERMINAL PERFORMANCE OBJECTIVE NO. 3.0 Printing

(Cont.)

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 3.4 | Operate a pilot press and complete a printing assignment and pad the finished sheets. | 3.4 | Following instructors directions, print your name on the pre-cut paper stock and pad the printed sheets. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0 INTERIM PERFORMANCE OBJECTIVE 3.1

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.1.1 | Recall a pilot press. | 3.1.1 | Name the press shown you by your instructor. | 3.1.1 | Lecture<br>Display | |
| 3.1.2 | Recall major components of a pilot press. | 3.1.2 | Orally identify the four (4) major components of a pilot press. | 3.1.2 | Pilot Press<br>Lecture | |
| 3.1.3 | Identify a composing stick and type. | 3.1.3 | Orally identify a composing stick. | 3.1.3 | Composing Stick<br>Demonstration | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0 INTERIM PERFORMANCE OBJECTIVE 3.2

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.2.1 | Identify a composing stick and hand set type. | 3.2.1 | Orally identify a composing stick and locate capital letter type. | 3.2.1 | Composing Stick<br>Capital Letter Type Tray<br>Lecture<br>Demonstration<br>Textbook | |
| 3.2.2 | Recall proper holding position of a composing stick and set type in the stick. | 3.2.2 | Following proper procedure, set your name in the composing stick with capital letter type. | 3.2.2 | Demonstration Type Tray<br>Composing Stick | |

# FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0

INTERIM PERFORMANCE OBJECTIVE 3.3

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.3.1 | Identify a chase | 3.3.1 | Orally name a chase and describe its purpose. | 3.3.1 | Chase<br>Demonstration | |
| 3.3.2 | Recall lock-up. | 3.3.2 | Observe the instructor lock the type in a chase. | 3.3.2 | Demonstration<br>Chase<br>Furniture | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0

INTERIM PERFORMANCE OBJECTIVE 3.4

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.4.1 | Recall printing process. | 3.4.1 | Demonstrate the correct method to print a finished job. | 3.4.1 | Equipment Demonstration | |
| 3.4.2 | Demonstrate the pilot press printing process. | 3.4.2 | Print the pre-cut paper stock issued you. | 3.4.2 | Equipment Demonstration | |
| 3.4.3 | Recall padding. | 3.4.3 | Using padding compound, form the printed sheet into a memo pad. | 3.4.3 | Pre-cut Sheets<br>Padding Compound<br>Demonstration | |

COURSE AMERICAN INDUSTRIES
(Graphic Communication)

TERMINAL PERFORMANCE
OBJECTIVE NO. 4.0 Rubber Stamp

With 80% proficiency, the learner will demonstrate his ability to construct a rubber stamp.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 4.1 | Using pre-set type, lock this type into a rubber stamp chase. | 4.1 | Following instructors direction, lock your name type into a rubber stamp oven chase. |
| 4.2 | Make the matrix impression for a rubber stamp. | 4.2 | Using the pre-cut matrix, form the rubber stamp impression in the stamp oven as directed by the instructor. |
| 4.3 | Make the rubber impression for a rubber stamp. | 4.3 | Using the pre-cut stamp rubber, form the rubber impression. |
| 4.4 | Adhere finished stamp to stamp molding. | 4.4 | Trim the finished rubber impression and adhere it to the stamp molding. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 4.0 INTERIM PERFORMANCE OBJECTIVE 4.1

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 4.1.1 | Recall hand type. | 4.1.1 | Clean your name type and ready it for making a stamp impression. | 4.1.1 | Demonstration | |
| 4.1.2 | Recall lock-up. | 4.1.2 | Following instructors direction and with his assistance, lock your name type into a rubber stamp chase. | 4.1.2 | Demonstration<br>Equipment | |
| 4.2.1 | Recall matrix stamp impressions. | 4.2.1 | Orally identify matrix and properly prepare the matrix to the type for printing. | 4.2.1 | Materials<br>Demonstration | |
| 4.2.2 | Demonstrate matrix stamp impression cooking. | 4.2.2 | Following instructors direction, place type and matrix in the stamp oven and make a matrix impression. | 4.2.2 | Materials<br>Equipment<br>Demonstration | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 4.0

INTERIM PERFORMANCE OBJECTIVE 4.3

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 4.3.1 | Recall rubber stamp impression | 4.3.1 | Identify orally, rubber stamp material and parting compound. | 4.3.1 | Materials Demonstration | |
| 4.3.2 | Demonstrate rubber stamp impression cooking. | 4.3.2 | Following instructors direction, apply parting compound and place the matrix and rubber into the oven and make the rubber impression. | 4.3.2 | Materials Demonstration | |
| 4.4.1 | Recall finishing steps in making a rubber stamp. | 4.4.1 | Identify cooked stamp impression, molding and glue. | 4.4.1 | Materials Demonstration | |
| 4.4.2 | Demonstrate the finishing process of rubber stamp making. | 4.4.2 | Trim the stamp impression and adhere the finished impression to pre-cut molding. | 4.4.2 | Materials Equipment Demonstration | |

COURSE AMERICAN INDUSTRIES

Graphic Communication

**TERMINAL PERFORMANCE OBJECTIVE NO.** 5.0 — Special Printing Process

With 80% proficiency, the learner will demonstrate his ability to print a finished product, using the silk screen method.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 5.1 | Identify the tools and equipment displayed that are used in the silk screen process.<br>1.) Silk Screen Frame<br>2.) Stencil Material<br>3.) Stencil Knife<br>4.) Tempra Paint<br>5.) Squeegee | 5.1 | Orally identify the tools and equipment displayed. |
| 5.2 | From an assigned or selected design, cut a stencil for a silk screen print. | 5.2 | Trace the design to the stencil paper and cut a stencil for silk screening. |
| 5.3 | Place the stencil under the silk. | 5.3 | Following instructions, place the stencil to be printed under the silk frame. |
| 5.4 | Print a silk screen finished product | 5.4 | Following instructions, apply the tempra ink to the silk frame and print the design on pre-cut paper stock. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 5.0

INTERIM PERFORMANCE OBJECTIVE 5.1

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 5.1.1 | Identify tools and equipment. | 5.1.1 | Orally identify the tools and equipment displayed. | 5.1.1 | Demonstration<br>Tools<br>Equipment | |
| 5 5.1.2 | Define use of silk screen tools and equipment. | 5.1.2 | State the practical use of the tools and equipment named in 5.1.1. | 5.1.2 | Demonstration<br>Tools<br>Equipment | |
| 5.2.1 | Identify tools and equipment. | 5.2.1 | Orally identify the tools and equipment displayed. | 5.2.1 | Tools<br>Equipment<br>Textbook<br>Demonstration | |
| 5.2.2 | Identify the use of tools and equipment. | 5.2.2 | Orally state the use of the tools and equipment displayed. | 5.2.2 | Tools<br>Equipment<br>Demonstration | |
| 5.2.3 | Demonstrate stencil cutting | 5.2.3 | Trace the design and cut the stencil. | 5.2.3 | Demonstration | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 5.0

INTERIM PERFORMANCE OBJECTIVE 5.3

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 5.3.1 | Recall stencil applying method. | 5.3.1 | Orally relate the method of applying a stencil to a silk screen. | 5.3.1 | Demonstration | |
| 5;3;2 | Demonstrate stencil attaching. | 5.3.2 | Attach the stencil to the silk. | | | |
| 5.4.1 | Recall silk screen printing process. | 5.4.1 | Demonstrate and orally describe how a silk print is made. | 5.4.1 | Equipment<br>Materials<br>Demonstration<br>Textbook | |
| 5.4.2 | Print by silk screen process. | 5.4.2 | Apply the ink to the frame and complete a silk screen print. | 5.4.2 | Equipment<br>Materials<br>Demonstration<br>Textbook | |

COURSE AMERICAN INDUSTRIES

(Graphic Communication)

TERMINAL PERFORMANCE OBJECTIVE NO. 6.0 — Offset Press

The learner will, with 75% proficiency, demonstrate his ability to produce a finished printing operation using an offset press.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 6.1 | Orally identify an offset press and define the principal by which it works. | 6.1 | Orally identify an offset press and state the principle of it operation as a process using a rubber blanket, a plate stencil and ink and water. |
| 6.2 | Orally identify the major components of an offset press. | 6.2 | Shown an offset press, you will orally identify its major components. |
| 6.3 | The learner will prepare a direct image offset master. | 6.3 | Prepare a paper master as instructed or use an instructor prepared master. (a memo pad is a suggested product) |
| 6.4 | In the presence of the instructor set up, test, and copy a direct image master. | 6.4 | Orally describe the operations necessary for setting, testing and running copies and run copies from the pre-cut stock. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 6.0 INTERIM PERFORMANCE OBJECTIVE 6.1-6.4

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 6.1.1 | Identify an offset press. | 6.1.1 | Orally identify the offset press. | 6.1.1 | Offset Press<br>Instruction | |
| 6.1.2 | Recall offset principle. | 6.1.2 | Orally describe offset printing principles. | 6.1.2 | Textbook<br>Lecture | |
| 6.2.1 | Recall components. | 6.2.1 | Study the diagram of the offset press. | 6.2.1 | Handout<br>Lecture<br>Textbook | |
| 6.2.2 | Identify components. | 6.2.2 | Orally name the press' major components. | 6.2.2 | Offset Press<br>Lecture | |
| 6.3.1 | Recall master copy impression tools. | 6.3.1 | Observe the basic tools displayed. | 6.3.1 | Equipment<br>Tools<br>Lecture | |
| 6.3.2 | Identify Tools. | 6.3.2 | Orally name the tools displayed. | 6.3.2 | Tools<br>Equipment | |
| 6.4 | Recall offset printing procedure. | 6.4.1 | Orally state the procedures necessary to run offset copies. | 6.4.1 | Offset Press<br>Demonstration | |
| 6.4 | Run copies. | 6.4.2 | As the instructor prepares the press, run copies as directed. | 6.4.2 | Stock<br>Offset Press<br>Demonstration | 128 |

COURSE AMERICAN INDUSTRIES

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0 — Drawing

The learner will be introduced to the basic principles of drawing and will demonstrate his ability to draw objects relating to Industrial Products: He will do this with 75% proficiency.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 7.1 | Identify basic drawing equipment and state a use for each.<br>1.) scale-measure<br>2.) T-square-straight horizontal lines<br>3.) board-drawing surface<br>4.) Triangles-perpendicular lines and angles | 7.1 | Orally identify the basic drawing equipment displayed and state a use for each. |
| 7.2 | Draw the following horizontal lines using pencil, T-square, board and scale.<br>1.) 1 inch long<br>2.) 1¼ inches long<br>3.) 2¾ inches long<br>4.) 5 inches long | 7.2 | Draw and measure the horizontal lines given by your instructor. |
| 7.3 | Draw perpendicular lines using board, scale, T-square, 30/60 triangle and pencil. | 7.3 | Draw the lines given in I.P.O. 7.2 at a 30 angle. |

COURSE AMERICAN INDUSTRIES
(Graphic Communication)

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0

Drawing

(Cont.)

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 7.4 | Draw a 4 inch cube isometrically on a 30 axis. | 7.4 | Using the basic drqwing instruments given, draw a cube isometrically. |
| 7.5 | Draw a 4 inch cube orthographically showing all sides. | 7.5 | Using basic drawing instruments, draw a 4 inch cube showing top, bottom front, right side, back and left side. |
| 7.6 | Demonstrate pattern drawing by cutting out the cube drawn in I.P.O. 7.5 and fold and fit it together. | 7.6 | Using sissors and tape, cut the pattern of the cube and fit it together. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 7.0

INTERIM PERFORMANCE OBJECTIVE 7.1-7.2

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 7.1.1 | Recall drawing instrument identification. | 7.1.1 | Orally identify the drawing instrument displayed. | 7.1.1 | Lecture<br>Textbook<br>Display | |
| 7.1.2 | Recall drawing instrument use. | 7.1.2 | Orally state a use for each instrument displayed. | 7.1.2 | Lecture<br>Display | |
| 7.2.1 | Recall drawing principles. | 7.2.1 | Orally name the instruments needed to measure and draw straight lines. | 7.2.1 | Lecture<br>Textbook<br>Instruments | |
| 7.2.2 | Draw horizontal lines. | 7.2.2 | Draw the horizontal lines to lengths stated by your instructor. | 7.2.2 | Lecture<br>Instruments | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 7.0 INTERIM PERFORMANCE OBJECTIVE 7.3-7.4

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ. |
|---|---|---|---|---|---|---|
| 7.3.1 | Recall drawing instrument identification. | 7.3.1 | Orally identify drawing instruments. | 7.3.1 | Instruments<br>Lecture | |
| 7.3.2 | Recall drawing principles. | 7.3.2 | Draw the perpendicular lines to length as stated by your instructor. | 7.3.2 | Demonstration | |
| 7.4.1 | Recall the principles of isometric drawing. | 7.4.1 | Orally identify the instruments needed to draw isometrically. | 7.4.1 | Instruments<br>Textbook<br>Lecture | |
| 7.4.2 | Draw isometrically. | 7.4.2 | Following instruction draw 4 inch cube isometrically. | 7.4.2 | Demonstration | |

## FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 1.0

INTERIM PERFORMANCE OBJECTIVE 7.5-7.6

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 7.5.1 | Recall the principles of orthographic drawing. | 7.5.1 | Orally identify the instruments needed to draw orthographically. | 7.5.1 | Display Demonstration | |
| 7.5.2 | Draw orthographically. | 7.5.2 | Following instructions draw a 4 inch cube orthographically. | 7.5.2 | Instruments Demonstration | |
| 7.6.1 | Recall pattern drawing. | 7.6.1 | Orally state howa pattern for a cube can be drawn. | 7.6.1 | Demonstration | |
| 7.6.2 | Draw patterns. | 7.6.2 | Draw a pattern for a 4 inch cube. | 7.6.2 | Demonstration | |

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.172-level 1-b)

Performance Objective No. 1.0
Intermediate Objective No. 1.1-1.2

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Write the five (5) responsibilities expected of you in the graphic laboratory and define each.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.167 level 1-e)

Performance Objective No. 2.0
Intermediate Objective No. 2.1-2.2

Source of your information
Author
Edition date

(Do not write on this sheet)

In writing, list twelve (12) areas of specialization in the Graphic Communication Field and define each.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.164-level 2-c)

Performance Objective No. 3.0
Intermediate Objective No. 3.1

Source of your information
Author
Edition date

(Do not write on this sheet)

**Orally identify a pilot press for your instructor and name its four (4) major components.**

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.168-level 2-a)

Performance Objective No. 3.0
Intermediate Objective No. 3.2

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

**Set your name in capital letters in the composing stick and space the lettering with instructors assistance.**

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.168-level 2-c)

Performance Objective No. 3.0
Intermediate Objective No. 3.3

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

**With instructors directions and assistance, lock your type in a pilot press chase.**

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.169-level 2-d)

Performance Objective No. 3.0
Intermediate Objective No. 3.4

ource of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Following directions, print your name on the pre-cut paper stock.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.160-level 3-C)

Performance Objective No. 4.0
Intermediate Objective No. 4.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

With your instructors assistance, lock your name type into a rubber stamp chase.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.168-level 2-A)

Performance Objective No. 4.0
Intermediate Objective No. 4.2

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Follow instructors direction and place the chase into the oven and make a stamp impression.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.168-level 2-A)

Performance Objective No. 4.0
Intermediate Objective No. 4.3

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Make a rubber stamp impression from the matrix following instruction.

Performance Objective No. 4.0
Intermediate Objective No. 4.4

Source of your information
Author
Edition date

(Do not write on this sheet)

Glue the finish rubber impression to the molding.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.161-level 1-C)

Performance Objective No. 5.0
Intermediate Objective No. 5.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Orally identify the tools and equipment displayed.

LEARNING PACKAGE

AMER NDUSTRIES

GRAPHIC COMMUNICATION

(X-4.161-level 1-C)

Performance Objective No. 5.0
Intermediate Objective No. 5.2

Source of your information
Author
Edition date

(Do not write on this sheet)

Trace the design to be silk screened and cut the stencil.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.161-level 1—C)

Performance Objective No. 5.0
Intermediate Objective No. 5.3

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

**Attach the stencil to the silk frame.**

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.163-level 3-C)

Performance Objective No. 5.0
Intermediate Objective No. 5.4

Source of your information

Author

Edition date

(Do not write on this sheet)

Print the design on pre-cut paper stock.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.160-level 3-C)

Performance Objective No. 6.0
Intermediate Objective No. 6.1-6.2

Source of your information
Author
Edition date

(Do not write on this sheet)

Identify the offset press in your laboratory and name its major components.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.161-level 1-C)

Performance Objective No. 6.0
Intermediate Objective No. 6.3

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Prepare a paper master as directed by the instructor.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION
(X-4.161-level 2-G)

Performance Objective No. 6.0
Intermediate Objective No. 6.4

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Run copies on an offset press in the presence of the instructor.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION

Performance Objective No. 7.0
Intermediate Objective No. 7.1

Source of your information
Author
Edition date

(Do not write on this sheet)

Orally identify the drawing instruments displayed.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION

Performance Objective No. 7.0
Intermediate Objective No. 7.2

Source of your information
Author
Edition date

(Do not write on this sheet)

Using the proper instruments, draw the horizontal line assigned by your instructor.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION

Performance Objective No. 7.0
Intermediate Objective No. 7.3

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using the proper instruments, draw the perpendicular lines assigned by your instructor.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION

Performance Objective No. 7.0
Intermediate Objective No. 7.4

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Draw a 4 inch cube isometrically.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION

Performance Objective No. 7.0
Intermediate Objective No. 7.5

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Draw a 4 inch cube orthographically.

LEARNING PACKAGE

AMERICAN INDUSTRIES

GRAPHIC COMMUNICATION

Performance Objective No. 7.0
Intermediate Objective No. 7.6

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Cut out the pattern for a cube drawn in 7.5.

AMERICAN INDUSTRIES

Power

1.0 Occupations

2.0 Electricity

3.0 Combustion Engines

4.0 Simple Machines

## SUGGESTED MOVIES

| | | |
|---|---|---|
| **Ignition and Spark Plugs** | Champion | 19 minutes |
| **Principle of Electricity** | GE | 20 minutes |
| **Story of the Modern Storage Battery** | Bureau of Mnes-USDI | 27 minutes |
| **Steam For Power** | Babcock and Wilcox | 41 minutes |
| **The Diesel Story** | Shell | 19 minutes |
| **ABC's of Internal Combustion** | GM | 13 minutes |
| **ABC's of Jet Engine** | GM | 17 minutes |
| **ABC's of Diesel Engines** | GM | 20 minutes |
| **Introduction to the Heat Engine** | Shell | 22 minutes |
| **Steam Power** | Babcock and Wilcox | 41 minutes |
| **Our Mr. Sun** | Bell | 60 minutes |

COURSE AMERICAN INDUSTRIES
(Power)

TERMINAL PERFORMANCE OBJECTIVE NO. 1.0 Occupations

The learner will, with 75% proficiency, orally identify five (5) occupational areas and will describe in writing one specific occupation in the power industries.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 1.1 | The learner will orally identify five occupational areas in the power industries.<br>1.) Construction Electrician<br>2.) Engine Mechanics<br>3.) Appliance Repairman<br>4.) Communication Electrician<br>5.) Engineering | 1.1 | Identify five (5) occupational areas in the power industries. |
| 1.2 | The learner will describe in writing one specific occupation in the power industries. | 1.2 | Describe in writing one specific occupation giving entrance requirements, training needed, working conditions, and and salaries expected. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 1.0 INTERIM PERFORMANCE OBJECTIVE 1.1 - 1.2

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 1.1.1 | The learner will recall five occupational areas in the power industries. | 1.1.1 | Study five occupational areas in the power industry. | 1.1.1 | Newspaper<br>Guidance Office<br>Library<br>Textbook<br>Lecture | |
| 1.1.2 | The learner will orally identify five occupational areas in the power industries. | 1.1.2 | Identify orally five occupational areas in the power industries. | 1.1.2 | Textbook<br>Lecture | |
| 1.2.1 | The learner will recognize one specific occupation given in the power industries. | 1.2.1 | The learner will select one specific occupation in the power industries. | 1.2.1 | Newspapers,<br>Guidance Office<br>Library<br>Personal Interview | |
| 1.2.2 | The learner will relate one specific occupation given in the power industries.<br>1.) entrance requirements<br>2.) training needed<br>3.) working conditions<br>4.) salaries | 1.2.2 | The learner will describe in writing one specific occupation in the power industries. | 1.2.2 | Textbook<br>Lecture | |

COURSE AMERICAN INDUSTRIES
(Power)

**TERMINAL PERFORMANCE OBJECTIVE NO.** 2.0 — Electricity

The learner will, with 75% proficiency, identify in writing the six (6) basic sources of electricity and give an example in writing of how each source is used in industry today.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 2.1 | The learner will identify in writing the six sources of electricity.<br>1.) Heat<br>2.) Light<br>3.) Magnetism<br>4.) Chemical<br>5.) Pressure<br>6.) Friction | 2.1 | Identify in writing the six basic sources of electricity. |
| 2.2 | The learner will write a short explanation of how each of the six sources of electricity is used in industry today. | 2.2 | Write a short explanation of how each of the six sources of electricity is used in industry. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 2.0

INTERIM PERFORMANCE OBJECTIVE 2.1-2.2

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 2.1.1 | The learner will recall the six basic sources of electricity. | 2.1.1 | Study the six basic sources of electricity | 2.1.1 | Textbook<br>Lecture | |
| 2.1.2 | The learner will list the six basic sources of electricity. | 2.1.2 | Write a list of the six basic sources of electricity. | 2.1.2 | Library<br>Films | |
| 2.2.1 | The learner will recall howeach of the six sources of electricity is used in industry today. | 2.2.1 | Write how each of the six sources of electricity is used in industry today. | 2.2.1 | Lecture<br>Library | |
| 2.2.2 | The learner will relate howeach of the six sources of electricity is used in industry today. | 2.2.2 | Write howeach of the six sources of electricity is used in industry today. | 2.2.2 | Lecture<br>Library | |

COURSE AMERICAN INDUSTRY
(Power)

TERMINAL PERFORMANCE OBJECTIVE NO. 3.0 — Combustion Engine

The learner will, with 75% proficiency, identify in writing two types of external combustion engines, six types of internal combustion engines, and the four basic engine systems.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 3.1 | The learner will identify in writing two types of external combustion engines. | 3.1 | Name two types of external combustion engines.<br>1.) Steam engine<br>2.) Steam turbine |
| 3.2 | The learner will identify in writing six types of internal combustion engines. | 3.2 | Name six types of internal combustion engines.<br>1.) 4-cycle<br>2.) 2-cycle<br>3.) Jet<br>4.) Rotary<br>5.) Rocket<br>6.) Gas turbine |
| 3.3 | The learner will identify in writing the four basic engine systems. | 3.3 | Name the four basic engine systems<br>1.) Fuel<br>2.) Lubrication<br>3.) Ignition<br>4.) Cooling |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0 INTERIM PERFORMANCE OBJECTIVE 3.1

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ. |
|---|---|---|---|---|---|---|
| 3.1.1 | The learner will recall two types of external combustion engines. | 3.1.1 | Recall orally two types of external combustion engines.<br>1.) Steam engine<br>2.) Steam turbine | 3.1.1 | Textbook<br>Lecture<br>Movies | |
| 3.1.2 | The learner will list two types of external combustion engines. | 3.1.2 | Identify in writing two types of external combustion engines. | 3.1.2 | Textbook<br>Lecture<br>Movies | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0

INTERIM PERFORMANCE OBJECTIVE 3.2

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.2.1 | The learner will recall six types of internal combustion engines. | 3.2.1 | Recall orally six types of internal combustion engines.<br>1.) 4-cycle<br>2.) 2-cycle<br>3.) Jet<br>4.) Rotary<br>5.) Rocket<br>6.) Turbine | 3.2.1 | Textbook<br>Lecture<br>Movies | |
| 3.2.2 | The learner will list six types of internal combustion engines. | 3.2.2 | Identify in writing six types of internal combustion engines.<br>1.) 4-cycle<br>2.) 2-cycle<br>3.) Jet<br>4.) Rotary<br>5.) Rocket<br>6.) Turbine | 3.2.2 | Textbook<br>Lecture<br>Movies | |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 3.0

INTERIM PERFORMANCE OBJECTIVE 3.3

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 3.3.1 | The learner will recall the four basic engine systems. | 3.3.1 | Recall orally the four basic engine systems.<br>1.) Fuel<br>2.) Lubrication<br>3.) Ignition<br>4.) Cooling | 3.3.1 | Lecture<br>Textbook | |
| 3.3.2 | The learner will identify the four basic engine systems. | 3.3.2 | Identify in writing the four basic engine systems.<br>1.) Fuel<br>2.) Lubrication<br>3.) Ignition<br>4.) Cooling | 3.3.2 | Lecture<br>Textbook | |

COURSE AMERICAN INDUSTRIES
(Power)

TERMINAL PERFORMANCE OBJECTIVE NO. 4.0 Simple Machines

The learner will, with 75% proficiency, identify in writing the six simple machines and give an example of how each is used in the laboratory.

| NO. | INTERMEDIATE PERFORMANCE OBJECTIVES | NO. | CRITERION MEASURES |
|---|---|---|---|
| 4.1 | The learner given pictorial drawings and a list of the following simple machines will, in writing, match the two.<br>1.) Lever 4.) Incline Plane<br>2.) Screw 5.) Pulley<br>3.) Wedge 6.) Wheel & axle | 4.1 | On the instruction sheet given you by the instructor, match in writing, the simple machines pictured with those listed. |
| 4.2 | The learner will list at least one example of how each simple machine is used on equipment and/or tools in the laboratory. | 4.2 | List at least one example of how each of the six simple machines is used on equipment and/or tools in the laboratory. |

FUNCTIONAL PERFORMANCE ANALYSIS

TERMINAL PERFORMANCE OBJECTIVE 4.0

INTERIM PERFORMANCE OBJECTIVE 4.1-4.2

| NO. | LEARNING STEPS | NO. | CRITERION PERFORMANCE EVALUATION (Response) | NO. | METHOD/MEDIA SELECTION | TIME REQ |
|---|---|---|---|---|---|---|
| 4.1.1 | The learner will recall the six simple machines. | 4.1.1 | Orally recall the six simple machines. | 4.1.1 | Lecture | |
| 4.1.2 | The learner will match in writing the simple machines pictured with those listed. | 4.1.2 | Match the simple machines pictured with those listed. | 4.1.2 | Handout<br>Lecture | |
| 4.2.1 | The learner will recall the picture of each simple machine . | 4.2.1 | Identify the picture of each of the six simple machines. | 4.2.1 | Lecture | |
| 4.2.2 | The learner will list at least one example of how each simple machine is used on equipment and/or tools in the laboratory. | 4.2.2 | List at least one example of howeach of thesix simple machines is on the equipment and/or tools in the laboratory | 4.2.2 | Lecture | |

LEARNING PACKAGE

AMERICAN INDUSTRIES

POWER
(X-4.167-level 1-E)

Performance Objective No. 1.0
Intermediate Objective No. 1.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Fromthe newspaper classified ads and occupational information obtained from the Guidance office, identify five general occupational areas in the power industries.

LEARNING PACKAGE

AMERICAN INDUSTRIES

POWER
(X-4.167-level 1-E) Occupations

Performance Objective No. 1.0
Intermediate Objective No. 1.2

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using occupational information found in the library and guidance, describe in writing one specific occupation in the power industries. Include in this description the entrance requirements, training needed, work conditions, and salaries expected for the occupation selected.

LEARNING PACKAGE

AMERICAN INDUSTRIES

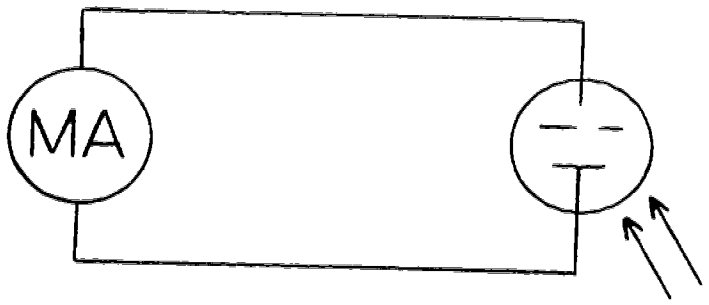
POWER
(X-4.168-level 2-A)

Performance Objective No. 2.0
Intermediate Objective No. 2.1

Source of your information
Author
Edition date

(Do not write on this sheet)

Using a milliameter, a solar cell and an external light source, you can demonstrate that light can produce electricity. Connect the solar cell to the milliameter as shown in the drawing. Place your hand over the solar cell. What is the reading on the milliameter? What is the reading on the milliameter when the solar cell is exposed to room light? What is the reading on the milliameter when the solar cell is exposed to an external light source? Explain howthis process could be used in industry today.



LEARNING PACKAGE

AMERICAN INDUSTRIES

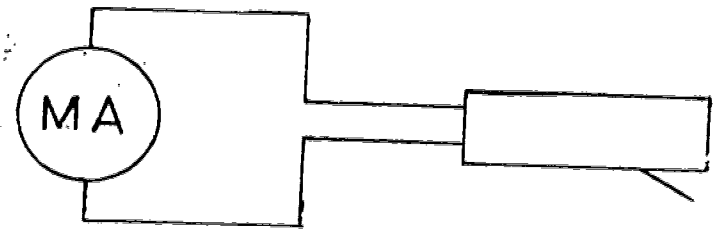
POWER
(X-4.173-level 2-F)

Performance Objective No. 2.0
Intermediate Objective No. 2.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

The mechanical distortion of a crystal will create a small electrical current. This phenomenon is known as the Piezoelectric effect. You may use a cartridge from an old record player and a milliameter to show this phenomenon. Hook the leads fromthe cartridge to the milliameter. Gently move the needle on the cartridge back and forth while observing the meter. Does the meter move? Which direction? Give an example of where the Piezoelectric effect is used in industry.



LEARNING PACKAGE

AMERICAN INDUSTRIES

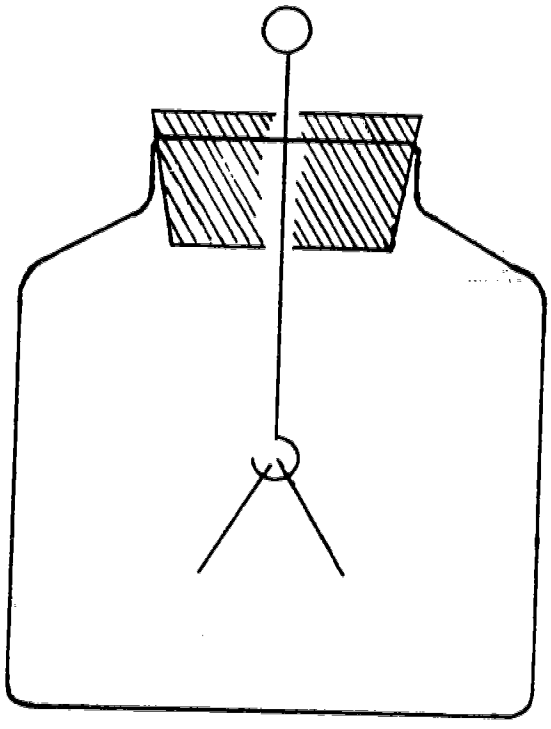
POWER
(X4.172-level 1-B)

Performance Objective No. 2.0
Intermediate Objective No. 2.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Electricity that is produced by friction is known as static electricity. To see the effect of static electricity, you will need a glass jar, a cork, a coat hanger, aluminum foil, a rubber rod and a wool cloth. Make a simple electroscope as shown in the drawing below. Rub the rubber rod with the wool cloth. Bring the rod close to (but do not touch) the electroscope. What happened to the leaves? What can you deduce from this? Name several processes using static electricity in industry today.



LEARNING PACKAGE

AMERICAN INDUSTRIES

POWER

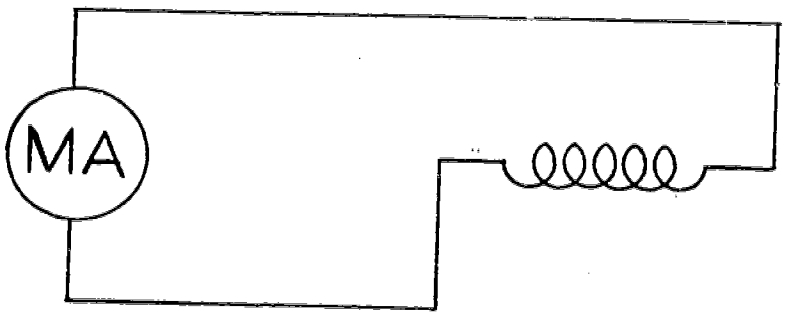
(X-4.169-level 2-D)

Performance Objective No. 2.0
Intermediate Objective No. 2.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

By using a milliameter, a coil of wire, and a magnet you can produce a flow of electricity. Hook both ends of the coil to the milliameter as shown in the drawing. Place the magnet in the hole of the coil, and rapidly move the magnet back and forth. Does the milliameter move? Explain the action of the meter. Give an example of how the resulting electricity is used in industry and home.



LEARNING PACKAGE

AMERICAN INDUSTRIES

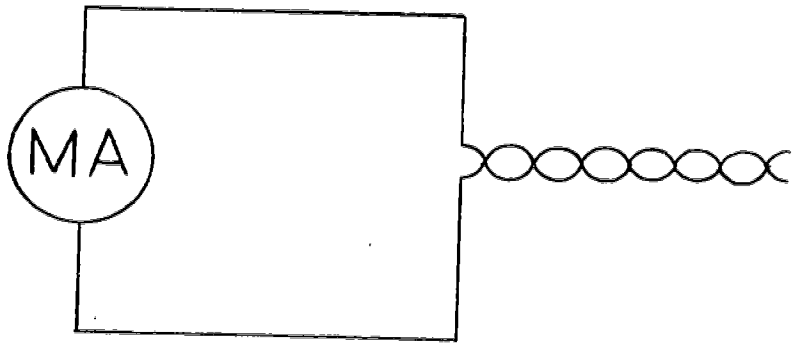
POWER
(X-4.160-level 3-C)

Performance Objective No. 2.0
Intermediate Objective No. 2.1-2.2

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using a milliameter, iron and constantan wire make a thermocouple by twisting one end of each wire together. Hook the other ends of the wires to the milliameter. Heat the twisted ends of the wires. Watch the milliameter. What happens? Where can this concept be used in industry?



LEARNING PACKAGE

AMERICAN INDUSTRIES

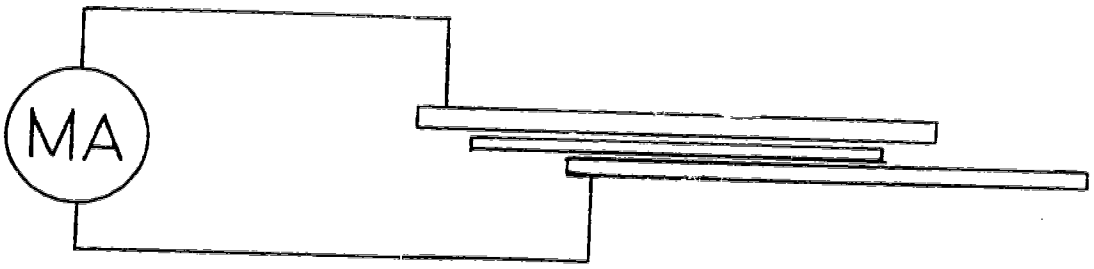
POWER
(X-4.170-level 2:C)

Performance Objective No. 2.0
Intermediate Objective No. 2.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

By using a milliameter, a copper and an aluminum plate, and a paper towel that has been soaked in a salt solution, you can make a simple cell. Connect a lead from the copper plate to the positive pole on the milliameter and a lead from the aluminum plate to the negative pole on the milliameters. Place the paper towel which was soaked in a salt solution between the aluminum and copper plates. Look at the meter. Is your cell producing electricity? Press down on the plates while watching the meter. Explain what happens. Give an example of chemical production of electricity in today's industry.



LEARNING PACKAGE

AMERICAN INDUSTRIES

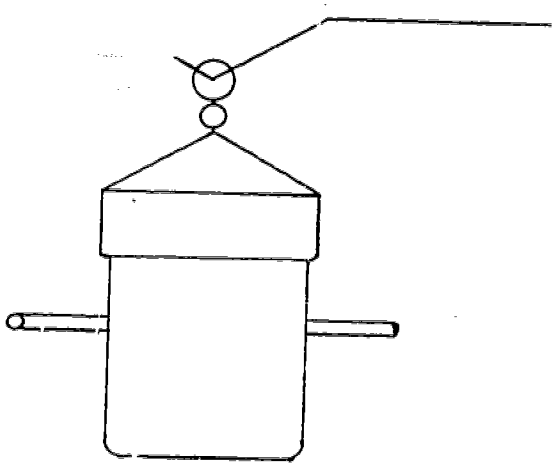
POWER
(X-4.161-level 1-C)

Performance Objective No. 3.0
Intermediate Objective No. 3.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Place ¼ inch of water in the bottom of the can and turn the top on tight. Make sure the tubes are clear of all dirt before heating. If they are clogged they may explode. Hang the engine on the supporting wire. Heat the can until the engine turns steadily. Do not heat the can after the steam stops. Let can cool 10 to 15 minutes before handling.



LEARNING PACKAGE

AMERICAN INDUSTRIES

POWER
(X-4.170-level 2-C)

Performance Objective No. 3.0
Intermediate Objective No. 3.2

Source of your information
Author
Edition date

(Do not write on this sheet)

Disassemble a small engine. Identify the engine as to whether it is a 2 or 4-cycle engine and identify orally the following major components of the engine:

1.) Cylinder

2.) Cylinder Head

3.) Piston

4.) Piston Rings

5.) Piston Pin

6.) Connecting Rod

7.) Crankshaft

8.) Crankcase

9.) Valves

10) Camshaft

Reassemble the engine.

LEARNING PACKAGE

AMERICAN INDUSTRIES

POWER
(X-4.169-level 2-D)

Performance Objective No. 3.0
Intermediate Objective No. 3.3

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Using a cut-away engine, identify the individual parts and group them into the four basic engine systems. (Example: The spark plug is in the ignition system)

LEARNING PACKAGE

AMERICAN INDUSTRIES

POWER
(X-4.169-level 2-D)

Performance Objective No. 4.0
Intermediate Objective No. 4.1

Source of your information _____
Author _____
Edition date _____

(Do not write on this sheet)

Match the following.

1.) Wheel and Axle

2.) Lever

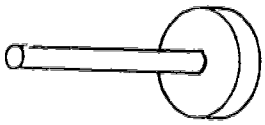
3.) Screw

4.) Pulley

5.) Wedge

6.) Incline Plane

A. 

B. 

C. 

D. 

E. 

F. 

LEARNING PACKAGE

AMERICAN INDUSTRIES

POWER
(X-4.169-level-2D)

Performance Objective No. 4.0
Intermediate Objective No. 4.2

Source of your information

Author

Edition date

(Do not write on this sheet)

List at least one example of how each of the six simple machines is used on the equipment and/or tools in the laboratory.