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AUTHOR Plescia, George W.; And Others
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ABSTRACT

The general purpose of the occupational analysis is to provide workable, basic information dealing with the many and varied duties performed in the drafting occupation. The document opens with a brief introduction followed by a job description. The bulk of the document is presented in table form. Twelve duties are broken down into a number of tasks and for each task a two-page table is presented, showing on the first page: tools, equipment, materials, objects acted upon; performance knowledge (related also to decisions, cues and errors); safety--hazard; and on the second page: science; math--number systems; and communications (performance modes, examples, and skills and concepts). The duties include: reproduction of drawings; maintaining and caring for tools and equipment; sketching objects; writing material list; drawing block diagrams, schematics, fasteners, details, and assemblies; laying out objects; checking drawings; and coordinating the drafting department. (BP)

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Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University

5238

AN ANALYSIS OF THE DRAFTING OCCUPATION

Developed by

George W. Plescia
Instructor, Drafting
West Technical High School
Cleveland, Ohio

Richard A. Price
Instructor, Drafting
Licking County J.V.S.
Newark, Ohio

Paul Richard Neff
Consultant
Western Electric
Columbus, Ohio

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Director: Tom L. Hindes
Coordinator: William L. Ashley

The Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University

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FOREWORD

The occupational analysis project was conducted by The Instructional Materials Laboratory, Trade and Industrial Education, The Ohio State University in conjunction with the State Department of Education, Division of Vocational Education pursuant to a grant from the U.S. Office of Education.

The Occupational Analysis project was proposed and conducted to train vocational educators in the techniques of making a comprehensive occupational analysis. Instructors were selected from Agriculture, Business, Distributive, Home Economics and Trade and Industrial Education to gain experience in developing analysis documents for sixty-one different occupations. Representatives from Business, Industry, Medicine, and Education were involved with the vocational instructors in conducting the analysis process.

The project was conducted in three phases. Phase one involved the planning and development of the project strategies. The analysis process was based on sound principles of learning and behavior. Phase two was the identification, selection and orientation of all participants. The training and workshop sessions constituted the third phase. Two-week workshops were held during which teams of vocational instructors conducted an analysis of the occupations in which they had employment experience. The instructors were assisted by both occupational consultants and subject matter specialists.

The project resulted in producing one hundred two trained vocational instructors capable of conducting and assisting in a comprehensive analysis of various occupations. Occupational analysis data were generated for sixty-one occupations. The analysis included a statement of the various tasks performed in each occupation. For each task the following items were identified: tools and equipment; procedural knowledge; safety knowledge; concepts and skills of mathematics, science and communication needed for successful performance in the occupation. The analysis data provided a basis for generating instructional materials, course outlines, student performance objectives, criterion measures as well as identifying specific supporting skills and knowledge in the academic subject areas.

PREFACE

It is felt that any instructor in drafting can use this analysis as a guide in writing a course curriculum regardless of the level of instruction. It has been elected to analyze the trade by dividing it into units of employment rather than trade specialties. These units are titled "Duty Statements." The levels of work that could take place within the duties are titled "Task Statements."

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The Ohio State University
Columbus, Ohio

Jodi Beittel, Communications
Columbus, Ohio

Diana L. Buckeye, Mathematics
University of Michigan
Avon Lake, Ohio

Rick Fien, Chemistry
The Ohio State University
Beachwood, Ohio

N.S. Gidwani, Chemistry
Columbus Technical Institute
Columbus, Ohio

Bruce A. Hull, Biology
The Ohio State University
Columbus, Ohio

Donald L. Hyatt, Physics
Worthington High School
Worthington, Ohio

Glenn Mann, Communications
Columbus, Ohio

Jerry McDonald, Physical Sciences
Columbus Technical Institute
Reynoldsburg, Ohio

Colleen Osinski, Psychology
Columbus Technical Institute
Columbus, Ohio

David Porteous, Communications
University of Connecticut
Colchester, Connecticut

James A. Sherlock, Communications
Columbus Technical Institute
Columbus, Ohio

Jim VanArsdall, Mathematics
Worthington High School
Worthington, Ohio

Lillian Yontz, Biology
The Ohio State University
Caldwell, Ohio

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Rita Buccilla	Typist
Peg Bushelman	Typist
Carol Fausnaugh	Typist
Mindy Fausnaugh	Typist
Rita Hastings	Typist
Carol Hicks	Typist
Sue Holsinger	Typist
Barbara Hughes	Typist
Carol Marvin	Typist
Patti Nye	Typist
Kathy Roediger	Typist
Mary Salay	Typist

JOB DESCRIPTION

A draftsman must interpret the ideas of the engineer and present them to the manufacturer or shop in the form of clear, complete and accurate working plans or detailed drawings. Making finished designs from sketches and changing existing drawings may also be in the scope of the draftsman's duties.

To perform these duties a draftsman must have excellent lettering and linework skills, be able to visualize and project the various views of an object, and have a working knowledge of manufacturing processes, engineering practices, mathematics, materials of industry, and other physical sciences which would enable him/her to complete drawings per the standards of the company in which he/she is employed

Duty A Reproduce Drawings

1 Trace drawings
2 Select reproduction method
3 Operate reproduction machines
4 Trim and bind prints
5 Control distribution

(TASK STATEMENT) TRACE DRAWINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table, drawing boards and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°60° and 45°), adjustable triangles, scales, protractor, curves, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpeners, compass (bow and beam), dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, scissors, hole punch, dusting brush, paper cutter, leroy set, wrico set, varityper, lettering guide, standards books	Inking Sharpening pencils Mounting paper Use tools and equipment Clean tracings KNOWLEDGE How to use types of straight edges Lead weights Pen sizes Eraser types How to sharpen pencil and lead How to clean pens Keep drawing clean	No heavy objects including elbows on light table Paper cutter Lead holder-check threads Equipment points and edges All electrical equipment grounded Adequate foot candles (20 minimum) lighting Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work

DECISIONS	CUES	ERRORS
Determine proper material to trace on and best method to use on this material Determine if drawing is correct and ready to reproduce	Know reproduction method and number of copies to be made from tracing Be aware of possible errors in master drawing	Inadaquate number or poor quality of reproductions Errors in manufacturing or job performance

(TASK STATEMENT) TRACE DRAWINGS

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Physical properties of lead Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Measures of length Measure of time and speed (Example: time-seconds, minutes, etc.; speed-feet per minute, R.P.M., etc.) Ratio and proportion Locate by approximation rational numbers and integers on the number line (sequential ordering) Parallel lines Perpendicular lines Angular lines Discrimination between triangle (90, 60 and 45°)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read work orders and requests Equipment instruction sheets Printed material on paper packages	Comprehension Trade and general vocabulary

(TASK STATEMENT) SELECT REPRODUCTION METHOD

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Calculator Adding machine Slide rule Pencils Scratch pad Erasers Pencil sharpener	Operate calculating equipment KNOWLEDGE Reproduction machines on hand Reproduction paper sizes and types Reproduction method cost and time Advantages and disadvantages of various types	Adequate foot candles (minimum 20) lighting All electrical equipment grounded Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work

DECISIONS	CUES	ERRORS
Determine type of reproduction to use as far as machine type	Evaluate the use, cost and time of reproduction Double check all calculations for accuracy	High reproduction cost and excessive time spent in reproduction

(TASK STATEMENT) SELECT REPRODUCTION METHOD

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Monetary systems Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Addition and subtraction of decimal fractions Multiplication and division of decimal fractions Measures of length Measure of time and speed (Example: time-seconds, minutes, etc.; speed-feet per minute, R.P.M., etc)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read trade manuals and instruction sheets on paper speeds, cost of reproduction and equipment	Comprehension Trade and general terminology

(TASK STATEMENT) OPERATE REPRODUCTION MACHINES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Paper cutter Scissors Mericode Microfilm Camera White printer Xerox Thermofax Duplicator Blueprinter Developer Reproduction paper Pencils Scratch pad Various reference books	Place developer in machine Set machine controls Operate reproduction machine Evaluate reproduction results KNOWLEDGE Type of developer to use Reproduction speed of the paper Control setting per masters media Developing speed control Be able to identify a quality reproduction	Ammonia fumes-white printer Chemicals under pressure in machine Hands in revolving machines Hazard of chemicals Electrical hazards and proper grounding No loose clothing Safety switch Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Determine if the quality of print is proper	Green lines indicate lack of developing time Background indicates lack of developing time Uneven print clarity indicates possible off level developer tank, weak ammonia or insufficient warm-up	Mistakes made in manufacturing due to the inability to read the print

(TASK STATEMENT) OPERATE REPRODUCTION MACHINE

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Inverse square law for light $E=1/D_2$	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Measures of length Measure of time and speed (Example: time-seconds, minutes, etc.; speed-feet per minute, R.P.M., etc.) Liquid and dry measures Ratio and proportion Measure with the Metric and English system and convert between them

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read operation manuals and instruction manuals	Comprehension Trade and general vocabulary

(TASK STATEMENT) TRIM AND BIND PRINTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Scales, pencils, scissors, hole punch, paper cutter, stapler, staples, brass clips, prestungs (paper fastners), stick files, T-square, parallel straight edge, gummed reinforcements, standards books, staple remover	Trim sheet to proper size Trim machines Bind prints in proper sequence Fold prints Place on stick file Make cover sheet KNOWLEDGE Proper sheet sizes Allow for binding edge Sequence of the set of prints How prints are to be stored	Paper cutter Equipment points and blades Adequate foot candles lighting (20 foot candles minimum) Ground electrical machines Safety switch Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work

DECISIONS	CUES	ERRORS
Select proper storage	Space allowed for print storage Area prints are to be used Size, usage, frequency of use, and material durability	Short life span of print and inability to be used as required

(TASK STATEMENT) TRIM AND BIND PRINTS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Measures of length Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Instruction manuals	Comprehension

(TASK STATEMENT) CONTROL DISTRIBUTION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Calculator Adding machine Stick files Flat files Catalog files Card files Pencils Memorandum sheets Request forms Pens Vault files Standards books Listing files	Operate calculating equipment Store print Store master Distribute prints Keep records of distribution KNOWLEDGE Mailing procedure Routing sequence Types of print storage available Request procedure	Adequate foot candles for lighting (20 foot candles minimum) Electrical equipment grounded Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Determine who receives the prints Determine how many copies are required and the usage of the prints distributed	Know status of master and prints (vintage or issue) Read memos for up-to-date additions to distribution list Neat clean area and records	Additional cost due to redistribution of additional prints Lost time and general job Slow down due to lack of information to manufacturing areas

(TASK STATEMENT) CONTROL DISTRIBUTION

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS		
PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read memos such as work request forms, updated distribution list and formulate accurate records for distribution	Memo format Business letter format Public speaking Poise Enunciation Telephone communication Comprehension Trade and general vocabulary A.V. training

Duty B Maintaining and Caring for Tools and Equipment

1 Properly store materials and supplies
2 Perform preventative maintenance on tools and equipment
3 Install and adjust tools and equipment

(TASK STATEMENT) PROPERLY STORE MATERIALS AND SUPPLIES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Stick files Flat files Catalog files Card files Reproductions Listing file Book cases Storage cabinets Vault files Request forms Various reference books	Inform supervisor of low inventory Keep accurate records of supply use Keep running inventory of equipment Report wasteful use of supplies and equipment KNOWLEDGE Storage requirements of material [Print paper] Required storage space Demand for inventory	Adequate foot candles for lighting (20 foot candles minimum) Proper lifting and moving procedures No obstructions on the floor Grounded electrical equipment Avoid overloading of storage facilities Store all solvents in locked metal cabinets Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Determine best way to store supplies for safe, efficient use	Eye level and weight control in vertically storing supplies PSI of shelving Secure all storage areas Keep neat, clean storage areas	Lifting injuries Lost time due to poor storage area

(TASK STATEMENT) PROPERLY STORE MATERIALS AND SUPPLIES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantages Work input, work output, friction and efficiency in simple machines Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements [Light breakdown on reproduction paper] Transfer of heat from one body to another	Locate by approximation rational numbers and integers on the number line (sequential ordering) Measures of length Knowledge of capacity (volume) estimation Determination of area and volume of rectangular, cube and right triangular prisms

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Safety information Storage instruction material	Comprehension Trade and general vocabulary

(TASK STATEMENT) PERFORM PREVENTATIVE MAINTENANCE ON TOOLS AND EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Ultrasonic cleaner Ink cleaning solvent Industrial cleaner Lubricant Dusting brush Cleaning cloth Pen brush Various reference books	Clean desk daily Clean tools and equipment as needed Lubricate equipment when needed Properly store tools and equipment not in use Use tools and equipment in the recommended way KNOWLEDGE Proper cleaning procedures Proper cleaning tools and solvents Proper lubricants Proper storage Proper usage How to use ultrasonic pen cleaner	Lubricants and solvents splashing in eyes Adequate foot candles for lighting (20 foot candles minimum) Grounded electrical equipment Equipment points and edges Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Determine if the equipment is in working order	Watch for: Nicks on drawing surfaces Inclines on pen tips Blunt pencil and compass lead Ink thickening or thinning Worn cables on parallel bar Wet eraser Lead breaking in pencil sharpener	Injuries may occur Poor quality work

(TASK STATEMENT) PERFORM PREVENTATIVE MAINTENANCE ON TOOLS AND EQUIPMENT

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality Properties of lubricants Developing fluids (properties)	Addition and subtraction of whole numbers Multiplication and division with whole numbers

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read instructions on the proper condition of equipment	Comprehension Trade and general vocabulary

(TASK STATEMENT) INSTALL AND ADJUST TOOLS AND EQUIPMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Allen wrenches Screwdrivers Hammer Pliers Socket set Utility knife Combination wrenches Triangles (30°-60° and 45°) Tape Various reference books	Install and adjust drafting machine Place cord and adjust parallel bar Install drawing board covers Adjust posture chairs KNOWLEDGE Tension adjustments on drafting machine and parallel bar How to string parallel bar How to install board covers How to adjust posture chairs and proper posture position How to square blades on drafting machine (triangle method)	Adequate foot candles for lighting (20 foot-candles minimum) Proper use of adjusting tools Be aware of spring loaded equipment Be aware of factory edges and burrs Lubricants and solvents splashing in eyes Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase or his/her work
DECISIONS	**CUES**	**ERRORS**
Select tools needed for installation and adjustment	Use proper tools for installing and adjusting equipment Refer to manuals prior to installing or adjusting any drafting equipment	Improper set up, resulting in a poor quality job Lost time in doing the job

(TASK STATEMENT) INSTALL AND ADJUST TOOLS AND EQUIPMENT

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Work input, work output, friction and efficiency in simple machines Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Knowledge of degrees]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read installation manuals and instruction sheets on adjustment of equipment	Comprehension Trade and general vocabulary

Duty C Sketching Objects

1 Select scale and sketch size
2 Determine media to use
3 Select type of sketch
4 Dimension and draw sketch
5 Select sketching materials

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(TASK STATEMENT) SELECT SCALE AND SKETCH SIZE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Scales Dividers Compass (bow and beam) Pencils Pencil sharpener Calculator Adding machine Slide rule Scratch pad Standards books Erasers	Operate calculating equipment Check standards book With dividers, scale and compass size object to be sketched KNOWLEDGE Drawing sheet sizes Various scales Needed proportion of object size to be sketched	Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Determine scale and sketch size	Various ways to show the object [Isometric, orthographic, etc.]	Lost time in reading a print that could be presented in a better manner

(TASK STATEMENT) SELECT SCALE AND SKETCH SIZE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion Measure with the Metric and English system and convert between them

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Trade instruction material on types of drawing presentation	Trade vocabulary Comprehension

(TASK STATEMENT) DETERMINE MEDIA TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pencils Pens Charcoals Pastels Paper stump Artype Inks Erasing powder Erasing shield Erasers Pounce Cleaning cloth Dusting brush Standards books Calculator Adding machine Slide rule Leroy set Wrico set Varityper	Check standards books Properly use calculating equipment Check DRG use Check reproduction method KNOWLEDGE Pencil lead weights Pen types and tips Sheet sizes Drafting materials Lettering method capacities Optional lettering devices	Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Select type of media to use	Select a media that allows the DRG to perform its function without sacrificing drawing time or factory costs Desired effect Examples: Ink or pencil, vellum or mylar	Poor reproductions Cost in producing Time lost in producing the drawings

(TASK STATEMENT) DETERMINE MEDIA TO USE

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Trade instruction material	Trade vocabulary Comprehension

(TASK STATEMENT) SELECT TYPE OF SKETCH

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Pencils Scratch pad Standards books Erasers Pencil sharpener	Choose best method to illustrate object Check standards book KNOWLEDGE Various methods of depicting objects The caliber of training level of people using sketch Various types of sketches	Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Most clear, simplified method of representation	Sketch should thoroughly explain problem in the most simplified method	Loss of time in reading and possible errors in work

(TASK STATEMENT) SELECT TYPE OF SKETCH

SCIENCE	MATH – NUMBER SYSTEMS
	Knowledge of geometric shapes: circles, rectangles, squares, hexagons and quadrilaterals

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Reading trade instructional material	Trade vocabulary Comprehension

(TASK STATEMENT) DIMENSION AND DRAW SKETCH

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
T-square, parallel straight edge, triangles (30°-60° and 45°), adjustable triangles, erasing shield, erasers, pencils, pencil sharpeners, pens, inks, erasing powder, pounce, cleaning cloth, tape, dusting brush, scales, drafting templates (various), drafting machines, artype, calculator, adding machine, slide rule, catalog card, card files, listing files, memorandum sheets, drafting table, drawing board and surface, chair (posture type), light table, curves, dividers, leroy set, wrico set, varityper, lettering guide, various reference books, standards books, compass (bow and beam)	Center the sketch Place construction lines Draw border lines and marginal information blocks Darken and shade sketch Add dimensions and marginal information Clean sketch Submit to checker KNOWLEDGE How to determine the need of additional view Methods of dimensioning Dimensioning systems Methods of indicating Line work applied to dimensioning Location and wording of marginal information Lead weights and pen sizes How to sketch ortho-pictorial views	Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and deges Electric eraser Properly ground all electrical equipment Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Determine best way of dimensioning	Maintain cleanliness, neatness, and accuracy throughout the sketch Dimensions should be located in a manner that would make the sketch easiest to read	Loss time in interpreting the sketch Possible errors in job

(TASK STATEMENT) DIMENSION AND DRAW SKETCH

SCIENCE	MATH – NUMBER SYSTEMS
Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Precision and accuracy Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) Ratio and proportion Multiplication and division of decimal fractions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Writing	Writing manufacturing and engineering notes Writing flaged information on dimension leader lines	Trade vocabulary Abstracts
Reading	Reading dimensionial rules and trade instruction sheets	Comprehension Footnoting

(TASK STATEMENT) SELECT SKETCHING MATERIALS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scratch pad Drawing paper or poster board Tracing paper Vellum Tracing linen Tracing film Scissors Pencils Pencil sharpener Frasers Standards books Hole punch	Note sketch requirements Select sketch material Check standards books KNOWLEDGE Qualities of sketching paper and poster board If reproduction is needed Use of sketch Where used	Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work
DECISIONS	**CUES**	**ERRORS**
Decide on sketching material to use	Select a material that functionally accomplishes it purpose without exceeding minimum cost and time	Added time and cost to company

(TASK STATEMENT) SELECT SKETCHING MATERIALS

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and inproper fractions Multiplication and division of proper and improper fractions Addition and subtraction of decimal fractions Multiplication and division of decimal fractions Measures of length Measures of weight Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Work request or job orders and trade instruction material	Physical experimentation report (oral or informal) Trade vocabulary omprehension

Duty D Writing Material List

1 Determine column headings
2 Place and draw material list
3 Organize and draw schedule information
4 Organize and draw keys and legends

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(TASK STATEMENT) DETERMINE COLUMN HEADINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pencils Scratch pad Pencil sharpener Erasers Calculator Adding machine Slide rule Standards books	Measure needed lettering in proportion to height Check standards books Operate calculating equipment Determine main titles and subheadings KNOWLEDGE Adequate column size Standard abbreviation terms Sheet size	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment
DECISIONS	**CUES**	**ERRORS**
Determine clear, understandable short headings	Make sure all column headings are provided for needed information Put in sequential order Space for wording is available	Misinterpretation of column's purpose or materials presented in the column

(TASK STATEMENT) DETERMINE COLUMN HEADINGS

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Measures of l[illegible]th Multiplicat[illegible] and division with whole numbers

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing Writing	Selecting comprehensive title headings Listing column materials in a logical order with proper spelling	Classification Spelling Trade terminology Readership level Abstracting Correct usage Clarity of expression Knowledge of denotative/connotative words

(TASK STATEMENT) PLACE AND DRAW MATERIAL LIST

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°) adjustable triangles, scales, drafting templates, drafting machines, erasing shield, pencils, pencil sharpener, dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper and poster board, tracing paper, vellum, tracing linen, tracing film, dusting brush, artype, calculator, adding machine, slide rule, leroy set, wrico set, varityper, and lettering guide standards book	Place in available space on required drawing Select proper line interval Draw needed lines Letter column headings and marginal information Letter material list Clean drawing Submit to checker KNOWLEDGE Types of lettering Location and wording of column headings Lead weights and pen sizes Various alternate lettering methods Symbols	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment Lubricants and solvents splashing in eyes Pounce and erasing powder in eyes

DECISIONS	CUES	ERRORS
Select best location Determine drawing space available	Check for possible placement on assembly When additional items may be required space should be provided Group like items	Wasted materials and drawings difficult to read

(TASK STATEMENT) PLACE AND DRAW MATERIAL LIST

SCIENCE	MATH – NUMBER SYSTEMS
	Ratio and proportion Determination of area, perimeter and diagonals of quadrilaterals (4 sided figures)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Viewing	Drawing	Visual analysis, Detail/inference

(TASK STATEMENT) ORGANIZE AND DRAW SCHEDULE INFORMATION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing boards and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°) adjustable triangles, scales, drafting templates (various), drafting machines, erasing shield, pencils, pencil sharpener, dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, dusting brush, artype, calculator, adding machine, slide rule, leroy set, wrico set, varityper, lettering guide, and standards books	Place in available space on required drawing Select proper line interval Draw needed lines Letter column headings and marginal information Letter schedule Clean drawing Submit to checker KNOWLEDGE Type of lettering Location and wording of column headings Lead weight and pen sizes Various alternate lettering methods Symbols	Safety awareness is important because a darftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment Lubricants and solvents splashing in eyes Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Schedule placement Determine if schedules or schedule is actually needed or could be covered at the item location	Locate schedule on or near sheet schedule information is written for Provide space for additional items Group like items and symbols	Wasted time and materials Schedule placed in a location difficult to find or hard to read

(TASK STATEMENT) ORGANIZE AND DRAW SCHEDULE INFORAMTION

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Measure with the Metric and English system and convert between them [Electrical base unit] Determination of area, perimeter and diagonals of quadrilaterals (4 sided figures) Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Addition and subtraction of decimal fractions Multiplication and division of decimal fractions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Symbol sheets and logically determining representative symbols to use on drawing	Classification Spelling Trade terminology Readership level Abstracting Correct usage Clarity of expression Knowledge of denotative/connotative words

(TASK STATEMENT) ORGANIZE AND DRAW KEYS AND LEGENDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°) adjustable triangles, scales, drafting templates (various), drafting machines, erasing shield, pencils, pencil sharpeners, dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, dusting brush, artype, calculator, adding machine, slide rule, leroy set, wrico set, varityper, lettering guide, various reference books, standards books	Place in available space on required drawing Select proper line interval Draw needed lines Letter column headings and marginal information Letter key Locate symbols Clean drawing Submit to checker KNOWLEDGE Lettering types Location and wording of column headings Lead weights and pen sizes Various alternate lettering methods Symbols	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment Lubricants and solvents splashing in eyes Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine key placement Determine if key is needed or can description be covered at item's location	Locate key on or near sheet that covers key's information Provide space for additional information Group like items and symbols	Wasted time and materials Keys located in a location difficult to find or hard to read

(TASK STATEMENT) ORGANIZE AND DRAW KEYS AND LEGENDS

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absoption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal ~~[Symbols]~~ Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Measures of length

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Simplifying information to a symbol form and classifying it in a usable manner	Clarity of expression Comprehension Trade terminology Classification Abstracting Spelling Editing and proofreading

Duty E Drawing Block Diagrams

1 Select scale and drawing size
2 Determine media to use
3 Draw and letter block and marginal information
4 Organize and draw keys and legends
5 Locate starting and completion point
6 Place direction of flow arrows

(TASK STATEMENT) SELECT SCALE AND DRAWING SIZE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Scales Erasers Pencils Pencil sharpener Compass (bow and beam) Dividers Scratch pad Calculator Adding machine Standards books Slide rule	Operate calculating equipment Check standards books With dividers scale and compass determine size of object to be drawn KNOWLEDGE Drawing sheet sizes Various scales Needed proportion of object size to be sketched	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment
DECISIONS	**CUES**	**ERRORS**
Decide on best scale and drawing size	The various ways to show the objectives of the block diagram [vertical versus horizontal flow]	Print difficult to read and understand

(TASK STATEMENT) SELECT SCALE AND DRAWING SIZE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read standards Books and instructional material	Trade vocabulary Comprehension

(TASK STATEMENT) DETERMINE MEDIA TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Pencils Pens Drawing paper or poster boards Tracing paper Vellum Tracing linen Tracing film Artype Leroy set Wrico set Varityper Standards books Calculator Adding machine Slide rule	Check standards books Properly use calculating equipment Check drawings use Check reproduction method KNOWLEDGE Pencil lead weights Pen types and sizes Sheet sizes Drafting material Lettering method capacities Optional lettering devices	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment
DECISIONS	**CUES**	**ERRORS**
Decide on best drawing method (ink or pencil) and material to use for each particular job	Select a media that allows the drawing to perform its function without sacrificing drawing time or company cost	Short life span of master or quality less than needed for the job

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(TASK STATEMENT) DETERMINE MEDIA TO USE

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read work request or job orders and standards books	Trade vocabulary Comprehension

(TASK STATEMENT) DRAW AND LETTER BLOCK AND MARGINAL INFORMATION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing board and surface, chair (posture type), T-square, parallel straight edge, triangles (30°-60° and 45°), adjustable triangles, scales, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, dusting powder, artype, leroy set, wrico set, varityper, lettering guide, standards books	Mount material Center and organize block structure Light construction Darken in blocks and connecting lines Letter blocks and marginal information Clean drawings Submit to checker KNOWLEDGE Lettering types Location and wording of block headings Lead weights and pen sizes Various alternate lettering methods Symbols and abbreviations	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment Lubricants and solvents splashing in eyes Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine that columns are of appropriate size Determine if blocks should be in sequential order of importance or use Determine if all information is included in block	Cover by notes and keys all unstandard symbols Information needed in block The information is contained in the block so it is easy to read All needed reference information	Incomplete or poorly organized block information Block information that is difficult to read or hard to understand

(TASK STATEMENT) DRAW AND LETTER BLOCK AND MARGINAL INFORMATION

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Measures of length Ratio and proportion Locate by approximation rational numbers and integers on the number line (sequential ordering) Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Title block information]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Writing		Conciseness Clarity of expression Spelling Abstracting Trade vocabulary
Reading	Work request or job orders, key or symbol information	Comprehension Classification Footnoting

(TASK STATEMENT) ORGANIZE AND DRAW KEYS AND LEGENDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°) adjustable triangles, scales, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, dusting brush, scratch pad, artype, leroy set, wrico set, varityper, lettering guide, various reference books, standards books	Place on available space on required drawing Select proper line interval Draw needed lines Letter column headings and marginal information Letter in keys and/or legend Locate and draw symbols Clean drawing Submit to checker KNOWLEDGE Lettering types Location and wording of column headings Lead weights and pen sizes Various alternate lettering methods Symbols	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment Lubricants and solvents splashing in eyes Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine best placement of key or legend, in location that is easy to find and provides space for expansion and grouping	Locate key on or near sheet that covers key information Provide space for additional information Group like items and information	Key or legends that are hard to find or may be missed Information in keys or legends that are easily missed or overlooked

(TASK STATEMENT) ORGANIZE AND DRAW KEYS AND LEGENDS

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Measures of length

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standa books, work request or job orde.	Clarity of expression Comprehension Trade terminology Classification Abstracting Spelling Editing and proofreading

(TASK STATEMENT) LOCATE STARTING AND COMPLETION POINT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Scales Pencils Pencil sharpener Erasers Dividers Scratch pad Calculator Adding machine Slide rule T-square Parallel straight edge Triangles (30°60° and 45°) Adjustable triangles Drafting table Drawing board and surface Chair (posture type)	Calculate location of starting and completion points Construct starting point Plan sequence Construct completion point Check for accuracy Complete drawing KNOWLEDGE Of diagrams purpose Scales Of construction lines Sequence of events or organization Proportions	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine best starting and finishing point	The staring point and completion point are probably the most critical areas on a block diagram as all flow, organization or sequence is based on these two locations; at all times consider these with most accuracy	Lost time in reading

(TASK STATEMENT) LOCATE STARTING AND COMPLETION POINT

SCIENCE	MATH – NUMBER SYSTEMS
	Ratio and proportion [Estimation of block size] Measures of length Locate by approximation rational numbers and integers on the number line (sequantial ordering)

COMMUNICATIONS		
PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books, written information to be blocked or schematic information	Comprehension Trade terminology

(TASK STATEMENT) PLACE DIRECTION OF FLOW ARROWS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table, drawing board and surface, chair (posture type), T-square, parallel straight edge, triangles (30°60° and 45°), scales, adjustable triangles, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, pens, inks, erasing powder, pounce, cleaning cloth, tape, dusting brush, artype, leroy set, wrico set, varityper, standards books	Locate blocks that are being drawn from and to Determine the flow direction Construct connecting line Draw in arrow Check standards for correct arrow and line weight Darken in line and arrow KNOWLEDGE The purpose and type of block diagram [Electrical-organization] Standard symbols or reference location Construction line weights Finish line weights Various lettering devices Templates	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candle for lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine flow direction	The arrows are probably as critical as any area on the block diagram; as they indicate the directional flow or sequence of events that take place or is represented by the block diagram	Final job incorrect causing lost time and money Incorrect interpretation of organizational information

(TASK STATEMENT) PLACE DIRECTION OF FLOW ARROWS

SCIENCE	MATH – NUMBER SYSTEMS
	Locate by approximation rational numbers and integers on the number line (sequential ordering) Measures of length

COMMUNICATIONS		
PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Work order, work request or any instructions given concerning the block diagram	Classification

Duty F Drawing Schematics

1 Draw standard conventional symbols
2 Place needed dimensions and information
3 Draw symbol connections
4 Select type of drawing to use
5 Determine scale and drawing size
6 Organize and draw keys and legends

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(TASK STATEMENT) DRAW STANDARD CONVENTIONAL SYMBOLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Catalog files Card files Various reference books Standards books	Check standards and reference books for standards symbols Create symbols not standardized Draw symbols Check for accuracy Proceed to draw symbol connections KNOWLEDGE Available reference books to use Purpose of schematic and who is to use it Trade term abbreviations Pencil leads and pen types Various lettering devices Proper line work and line weight	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Decide on correct symbol representation	Use templates wherever possible In creating symbols use logical ways to represent in a symbolic form, the information being conveyed to the worker	Job may be incorrectly done resulting in a non-functional product

(TASK STATEMENT) DRAW STANDARD CONVENTIONAL SYMBOLS

SCIENCE	MATH – NUMBER SYSTEMS
	Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Symbol-numerical] Locate by approximation rational numbers and integers on the number line (sequential ordering) [Symbol placement]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Reading and understanding job instructions	Comprehension Trade vocabulary

(TASK STATEMENT) PLACE NEEDED DIMENSIONS AND INFORMATION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-sqaure, parallel straight edge, triangles (30°60° and 45°) adjustable triangles, scales, protractors, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, dusting powder, artype, calculator, adding machine, slide rule, catalog files, card files, memorandum sheets, storage cabinets, lerov set, wrico set, varityper, lettering guide, various reference books, standards books	Check standards book and reference book for standard method of dimensioning particular schematic Construct guide lines Draw needed lines and symbols Letter dimensions and marginal information Check work KNOWLEDGE Available reference material and standards books Pencil lead and pen sizes Proper line weight and line work Proper freehand lettering Various lettering devices	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine if all dimensions and information are included and in an easy location to find and read	A draftsman should perform a double check on dimensioning before and after lettering Be certain all marginal information is complete and included on schematic	Lost time and possibly incorrect product due to conclusions made during manufacturing

(TASK STATEMENT) PLACE NEEDED DIMENSIONS AND INFORMATION

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) [Scales, see tools list] Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books and job instruction sheets	Library information Comprehension Trade vocabulary Abstracting Spelling Footnoting Usage Clarity of expression

TASK STATEMENT) DRAW SYMBOL CONNECTIONS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°), adjustable triangles, scales, drafting templates (various), drafting machine, erasing shield, erasers, pencils, pencil sharpener, pens, inks, erasing powder, pounce, cleaning cloth, tape, dusting brush, artype, leroy set, wrico set, varityper, various reference books, standards books	Locate symbols being drawn Construct connecting lines Draw arrows where needed Check standards for line weight Darken in lines and arrows Check all connections for accuracy KNOWLEDGE The purpose of the schematic Construction and finished line weights Pencil leads and pen sizes Templates	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eye

DECISIONS	CUES	ERRORS
Determine if symbols are properly connected	Check to see if connecting lines must be to a length scale When connecting lines run off sheet make sure they are referenced as to where to go, and at that location, where they are from	Lost time and incorrect product

TASK STATEMENT) DRAW SYMBOL CONNECTIONS

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Measures of length Ratio and proportion Locate by approximation rational numbers and integers on the number line (sequential ordering) [Sheet continuation]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Job instruction information	Classification

(TASK STATEMENT) SELECT TYPE OF DRAWING TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Various reference books Pencil sharpener Pencils Standards books Scratch pad Calculator Erasers Adding machine Slide rule	Determine purpose of schedule Make calculations on size of drawing, cost of time spent Sketch various type possibilities KNOWLEDGE Know the various types of schematics Know the completion time of types Know who is going to look at schematic and for what purpose	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges
DECISIONS	**CUES**	**ERRORS**
Determine size of drawing and method of presenting schematic	Training background of the workers using the schematic	Lost time in drawing room and during assembly High cost due to material waste and lost time Difficulty in reading schematic

(TASK STATEMENT) SELECT TYPE OF DRAWING TO USE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Job instruction information and standards information	Comprehension

TASK STATEMENT) DETERMINE SCALE AND DRAWING SIZE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standards books Calculator Adding machine Slide rule Scratch pad Pencils Pencil sharpener Erasers	Operate calculating equipment Check standards book With dividers scale and compass determine size of object to be drawn Check into purpose of drawing KNOWLEDGE Drawing sheet sizes Various scales Needed proportion of object size to be sketched	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment
DECISIONS	**CUES**	**ERRORS**
Decide on size and scale of drawing	The various ways to show the objectives of the block diagram [vertical versus horizontal flow]	Difficulty in reading drawing

(TASK STATEMENT) DETERMINE SCALE AND DRAWING SIZE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion Measure with the Metric and English system and convert between them Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books	Comprehension Trade vocabulary

TASK STAT ENT) ORGANIZE AND DRA KEYS AND LEGENDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°), adjustable triangles, scales, drafting templates (various), drafting machines, erasing shield, pencils, pencil sharpener, dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, dusting powder, artype, calculator, adding machine, slide rule, leroy set, wrico set, varityper, lettering guide, various reference books, standards books	Construct keys or legends for symbols Draw keys and legends Place description and symbols in keys and legends Check to make sure all symbols needed are included in key or legend KNOWLEDGE Pencil lead and pen types Various lettering devices Proper linework and lineweight Available reference and standards books Symbols How to word and abbreviate column headings	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment Lubricants and solvents in eyes Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine best placement of keys and legends	Use templates wherever possible Include keys and legends on the sheet they explain wherever possible Make all created symbols logical for ease in interpreting Easy to find and space provided for expansion and grouping	Not being able to locate or find keys or legends Key or legend information that is hard to find or is overlooked

(TASK STATEMENT) ORGANIZE AND DRAW KEYS AND LEGENDS

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Measures of length

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books, work request or job orders	Clarity of expression Comprehension Trade terminology Classification Abstracting Spelling Editing and proofreading

Duty G Laying Out Objects

1 Select scale and drawing size
2 Determine media to use
3 Construct and draw geometric forms
4 Locate construction points
5 Locate needed dimensions and information

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TASK STATEMENT) SELECT SCALE AND DRAWING SIZE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standards books Calculator Adding machine Slide rule Scratch pad Erasers Pencils Pencil sharpener Various reference books	Operate calculating equipment Check standards books Size object by rough scaling, dividing or compass proportioning Check purpose of drawing (full scale template or not) KNOWLEDGE Drawing sheet sizes Various scales Needed proportion of object size to be drawn	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment
DECISIONS	**CUES**	**ERRORS**
Determine if sheet size and scale is large enough to provide ample space for drawing and margin information.	Be aware of purpose of drawing Many times draftsman forget to allow space for bottoms and tops of developed or layed-out objects	Crowded drawing Lost time due to difficulty in reading

(TASK STATEMENT) SELECT SCALE AND DRAWING SIZE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Trade instructional materials, standards books	Comprehension Trade vocabulary

TASK STATEMENT) DETERMINE MEDIA TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Pencils, pens, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, artype, leroy set, wrico set, varityper, various reference books, standards books, erasers, pencil sharpener, inks, pounce, cleaning cloth, scratch pad	Check standards books Properly use calculating equipment Check drawings use Check reproduction method KNOWLEDGE Pencil lead weights Pen types and sizes Sheet sizes Drafting material Drawing method capacities Optional drawing devices Purpose of layout for correct material selection (template)	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment
DECISIONS	**CUES**	**ERRORS**
Select a media to present drawing	Select a media that allows the drawing to perform its function without sacrificing drawing time or company cost	Lost time and money Lack of required quality in some cases

(TASK STATEMENT) DETERMINE MEDIA TO USE

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Trade instruction materials	Comprehension Trade vocabulary

(TASK STATEMENT) CONSTRUCT AND DRAW GEOMETRIC FORMS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°), adjustable triangles, scales, drafting templates (various), drafting machines, erasing shield, pencils, pencil sharpener, dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing linen, tracing film, dusting brush, artype, calculator, adding machine, slide rule, various reference books, standards books, tracing paper	Use reference material to determine proper procedure Layout reference lines Construct geometric form Darken geometric form Check work KNOWLEDGE Available reference material Use of construction tools [Compass, divider, triangles, etc.] Pencil lead and pen sizes Basic geometric shapes Intersections of lines, points, and surfaces Line weights and line work True length of lines Normal versus oblique views of surfaces Cleaning procedure	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Ground all electrical equipment

DECISIONS	CUES	ERRORS
Check for correctness of orthographic views Determine if layout is to be a drawing or template	Check two plane projections of all solid objects to insure three-dimensional shape Usage of drawing	Incorrect drawing or construction Unable to use drawing for specified purpose

(TASK STATEMENT) CONSTRUCT AND DRAW GEOMETRIC FORMS

SCIENCE	MATH -- NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantages Effects of friction on work processes and product quality	Geometric constructions Measures of length Addition, subtraction, multiplication, division with whole numbers Addition, subtraction, multiplication, division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Ratio and proportion Measure with the Metric and English system and convert between them Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) Locate by approximation rational numbers and integers on the number line (sequential ordering) Determination of facts involving sectors of a circle

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Plane geometry text, Trade instruction materials	Research procedures Comprehension Trade vocabulary

(TASK STATEMENT) LOCATE CONSTRUCTION POINTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°), adjustable triangles, scales, protractors, curves, drafting template (various), drafting machines, erasing shield, erasers, pencils, pencil sharpeners, compass (bow and beam), dividers, erasing powder, cleaning cloth, various reference books, standards books, dusting powder, scratch pad, calculator, adding machine, slide rule	Calculate location of starting and completion points Plan sequence Locate starting and completion point Check for accuracy Place construction point numbers on drawing where needed KNOWLEDGE Sequence of mating surfaces Lead weight and pen sizes Proper lettering system Various lettering devices	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine starting points of construction for best drawing presentation	Construction point numbers may or may not be shown on drawing, depending on its intended use	Drawing poorly located on sheet making it hard to read and allowing possible errors

(TASK STATEMENT) LOCATE CONSTRUCTION POINTS

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Measures of length Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Locate by approximation rational numbers and integers on the number line (sequential ordering) Determination of area and circumference of circles Determination of area, perimeter and diagonals of polygons with more than four sides Determination of area, perimeter and diagonals of quadrilaterals (four sided figures) Use of trigonometric functions in solution of problems involving right triangles Understanding and use of the Pythagorean theorem, based on the right triangle

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Trade instruction material, such as "How To Draw A Truncated Prism"	Comprehension Trade Vocabulary

(TASK STATEMENT) LOCATE NEEDED DIMENSIONS AND INFORMATION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
T-square, parallel straight edge, triangles (30°-60° and 45°) adjustable triangles, scales, protractors, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), pens, inks, erasing powder, cleaning cloth, adding machine, slide rule, stick files, lettering guides, various reference books, standards books, pounce	Check standards book Determine drawing use as to needed dimensions Construct guide lines Draw needed lines and dimensions Check work KNOWLEDGE Available standards book Pencil lead and pen sizes Proper line weight and line work Proper freehand lettering Various lettering devices	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles for lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine if any dimensions are needed	Instructions	Possible error – wrong scale

(TASK STATEMENT) LOCATE NEEDED DIMENSIONS AND INFORMATION

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of decimal fractions Measures of length Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards book and trade instructions material	Library information Comprehension Trade vocabulary Abstracting Spelling Footnoting Usage Clarity of expression

Duty II Drawing Fasteners

1 Determine drawing method or representation
2 Draw and specify permanent fasteners
3 Draw and specify non-permanent fasteners
4 Select scale and drawing size
5 Select media to use

(TASK STATEMENT) DETERMINE DRAWING METHOD OR REPRESENTATION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Erasers Scratch pad Pencils Various reference books Pencil sharpener Standards books Calculator Adding machine Slide rule	Make calculations on size and number of threads required Determine DRG's use Sketch various ways of representing fasteners Check for alternate fasteners KNOWLEDGE Operate calculating equipment Who will use the drawing Various ways of representing threads Knowledge of materials fasteners are to secure	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine strength of needed fastener	Never indicate a fastener that might be substituted by a less expensive fastener without sacrificing strength and properties of mating material	Loss of time Loss of money to the company

(TASK STATEMENT) DETERMINE DRAWING METHOD OR REPRESENTATION

SCIENCE	MATH – NUMBER SYSTEMS
	Measure of time and speed (Example: time-seconds, minutes, etc.; speed-feet per minute, R.P.M.,etc.) [Estimation of time] Monetary systems (estimation of cost) Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Addition and subtraction of decimal fractions Multiplication and division of decimal fractions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books, suppliers' catalogs and machinery handbook	Comprehension Trade vocabulary

(TASK STATEMENT) DRAW AND SPECIFY PERMANENT FASTENERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°), adjustable triangles, scales, protractors, curves, drafting templates (various), drafting machine, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, dusting brush, leroy set, wrico set, varityper, lettering guide, various reference books, standards books, artype	Check standard book for drawing method Layout fastener Construct internal features Darken drawing Letter specifications Clean drawing Submit to checker KNOWLEDGE Available reference and standards books Construction line weight Methods of representing threads Methods of specifing threads Internal features of various fasteners Pencil leads and pen sizes Line work and line weight Proper lettering procedure Various lettering devices How to clean drawing	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Decide on type and strength of fastener to use	Never indicate a fastener that might be substituted by a less expensive fastener without sacrificing strength and properties of mating material	Added cost to company and occasionally lose time in manufacturing or assembly

(TASK STATEMENT) DRAW AND SPECIFY PERMANENT FASTENERS

SCIENCE	MATH – NUMBER SYSTEMS
Resistance of materials to change in shape [Stresses (tension and shear)] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [Properties of materials] Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Measures of length Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Designating nails, weld symbols, wire gauges, tapping screw points] Knowledge of angles Locate by approximation rational numbers and integers on the number line (sequential ordering) Use of trigonometric functions in solution of problems involving right triangles; understanding and use of Pythagorean theorem, based on the right triangle Read and interpret charts, tables, and/or graphs Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) Ratio and proportion Measure with the Metric and English system and convert between them Addition, subtraction, multiplication, and division of whole numbers, decimals, and fractions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read standards book, supplier's catalogs and machinery handbook also physics book possibly	Comprehension Trade vocabulary Abstracting Spelling Footnoting Usage Clarity of expression

(TASK STATEMENT) DRAW AND SPECIFY NON-PERMANENT FASTENERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30-60° and 45°), adjustable triangles, scales, protractors, curves, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, dusting brush, artype, leroy set, wrico set, varityper, lettering guide, various reference books, standards books	Check standards book for drawing method Layout fastener Construct internal features Darken drawing Letter specifications Clean drawing Submit to checker KNOWLEDGE Available reference and standards book Construction line weight Methods of representing Methods of specifying Internal features of various fasteners Pencil leads and pen sizes Line work and line weight Proper lettering procedures Various lettering devices How to clean drawing	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eye

DECISIONS	CUES	ERRORS
Decide on type and strength of fastener to use	Never indicate a fastener that might be substituted by a less expensive fastener without sacrificing strength and properties of mating material	Added lost to company and occasionally lost time in manufacturing and assembly

TASK STATEMENT) DRAW AND SPECIFY NON-PERMANENT FASTENERS

SCIENCE	MATH – NUMBER SYSTEMS
Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [Tensil strength] Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product wuality	Measures of length Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Head designation, point designation, unified national, American national, metric, spring code, thread code] Locate by approximation rational numbers and integers on the number line (sequential ordering) Read and interpret charts, tables, and/or graphs Measure with the Metric and English system and convert between them Ratio and proportion Understanding and use of Pythagorean theorem, based on the right triangle; use of trigonometric functions in solution of problems involving right triangles Addition, subtraction, multiplication, and division of whole numbers, decimals, and fractions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read standards book, supplier's catalog and machinerys handbook Also physics books possibly	Comprehension Trade vocabulary Abstracting Spelling Footnoting Usage Clarity of expression

(TASK STATEMENT) SELECT SCALE AND DRAWING SIZE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY HAZARD
Standards books Various reference books Calculator Adding machine Slide rule Scratch pad Erasers Pencils Pencil sharpener	Operate calculating equipment Check standards books With dividers, scale, and compass determine the size of the object to be drawn KNOWLEDGE Drawing sheet sizes Various scales Needed proportions of objects to be sketched	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine proper scale and drawing size Determine way of presenting choice of fastener	The various ways of showing the fastener drawn [Example: Isometric, sectioned, orthorgraphic]	Drawing difficult to read and understand If scale, drawing size and method of presentation is poor

(TASK STATEMENT) SELECT SCALE AND DRAWING SIZE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Changing mixed numbers to improper fractions Addition and subtraction of improper fractions Measures of length Ratio and proportion Measure with the Metric and English system and convert between them Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books and trade instruction sheets or reference books	Comprehension Trade vocabulary

(TASK STATEMENT) SELECT MEDIA TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Erasers Pencils Pencil sharpener Pens Drawing paper or poster board Tracing paper Vellum Tracing linen Tracing film Artype Leroy set Wrico set Varityper Various reference books Standards books Scratch pad	Check standards book Make calculations Check to determine who will use the drawing and for what purpose Check reproduction method available KNOWLEDGE Pencil lead weights Pen types and sizes Various drafting materials available Proper lettering techniques Optional lettering devices	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes

DECISIONS	CUES	ERRORS
Determine how to present drawing (media) based on usage of drawing	Select a media that allows the drawing to perform its functions without sacrificing drawing time, reproduction time, and in general company cost	Inferior reproductions inadaquate for drawings purpose

(TASK STATEMENT) SELECT MEDIA TO USE

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	• Read standards books, work request, job orders	Comprehension Trade vocabulary

Duty I Drawing Details

1 Select method of drawing detail
2 Determine part scale and sheet size
3 Select media to use
4 Draw, dimension and tolerance details
5 Determine the need of additional views
6 Place marginal information

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(TASK STATEMENT) SELECT METHOD OF DRAWING DETAIL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Erasers Pencils Pencil sharpener Various reference books Standards books Calculator Adding machine Slide rule Scratch pad	Check standards books Determine use of drawing Make calculations necessary in selecting the drawing method Make sketches of part by various methods KNOWLEDGE Available standards books Operate calculating equipment Various ways of drawing details [Orthographic, isometric, etc.] How drawing will be reproduced Who will use drawing	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Select most descriptive view and make it the front view (in most cases)	The front view regardless of method should be the most descriptive view if possible Length of object and the working position might alter the rule of thumb	Lost time due to print being difficult to read

(TASK STATEMENT) SLECT METHOD OF DRAWING DETAIL

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Monetary system Measure of time and speed (Example: time-seconds, minutes, etc.; speed-feet per minute, R.P.M., etc.) Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books, reference books and trade instruction material	Comprehension Trade vocabulary

(TASK STATEMENT) DETERMINE PART SCALE AND SHEET SIZE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Erasers Pencils Pencil sharpener Scratch pad Various reference books Standards books Calculator Adding machine Slide rule	Operate calculating equipment Check standards books With dividers, scale, and compass, determine the size of the object to be drawn KNOWLEDGE Drawing sheet sizes Various scales Needed proportions of object to be sketched	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine a good scale and sheet size for drawing	In selecting the proper scale and sheet size the draftsman should keep in mind what method is being done and be aware that different methods to be shown properly require different scales	Poor prints or prints difficult to read causing lost time in print reading

(TASK STATEMENT) DETERMINE PART SCALE AND SHEET SIZE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Multiplication and division of decimal fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books, reference books and trade instructional material	Comprehension Sheet size

(TASK STATEMENT) SELECT MEDIA TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Erasers Pencils Pencil sharpener Pens Drawing paper or poster board Tracing paper Vellum Tracing linen Tracing film Artype Leroy set Wrico set Varityper Various reference books Standards books Scratch pad	Check standards book Make calculations Check on drawing use and by whom Check reproduction methods available KNOWLEDGE Pencil lead weights Pen tyes and sizes Standard sheet sizes Qualities of various materials available Lettering techniques Optional lettering devices	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lgihting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Decide on media to use	Select media that allows the drawing to perform its function without sacrificing drawing time, reproduction time and in general company cost	Additional cost to company

(TASK STATEMENT) SELECT MEDIA TO USE

SCIENCE	MATH – NUMBER SYSTEMS
Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Simple machines used to gain mechanical advantage Effects of friction on work processes and product quality	Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards and reference books	Comprehension Trade vocabulary

(TASK STATEMENT) DRAW, DIMENSION AND TOLERANCE DETAILS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°) adjustable triangles, scales, protractors, curves, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, dusting brush, artype, calculator, adding machine, slide rule, various reference books, standards books, leroy set, wrico set, varityper, lettering guide	Mount drawing material Layout features and project views with construction lines Darken in views Draw needed dimension extension and leader lines Letter dimensions and tolerances where needed Check work and calculations Submit to checker KNOWLEDGE Available reference and standards books Construction line weights Pencil leads and pen sizes Line work and line weight Proper lettering procedure Various lettering devices Methods of dimensioning Methods of tolerance Clean drawing	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes Lubricants and solvents splashing in eyes
DECISIONS	**CUES**	**ERRORS**
Decide the most economical way to produce the part without sacrificing quality	A draftsman should have a sound knowledge of manufacturing process (milling) prior to tolerancing drawings Always check reference books and standards books prior to assigning dimensions and tolerances	Lost time Additional cost to company An inferior product

TASK STATEMENT) DRAW, DIMENSION AND TOLERANCE DETAILS

SCIENCE	MATH – NUMBER SYSTEMS
Centrifugal forces developed by bodies in rotation Centripetal forces developed by bodies in rotation [Journal pressure] Effects of friction on work processes and product quality Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark, rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Relationship of force to distortion in an elastic body Arrangement of molecules, atoms and ions and the effect on structure and strength of materials Resistance of materials to change in shape	Measures of length Addition, subtraction, division, and multiplication of whole numbers Addition, subtraction, division, and multiplication of proper and improper fractions Addition, subtraction, multiplication, and division of decimal fractions Measure with the Metric and English system and convert between them Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) [Tolerances] Ratio and proportion Read and interpret charts, tables, and/or graphs [Guide for selecting tolerances, cylindrical fits, contour tolerance symbols]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read trade instructional material, standards books, and machinerys handbook	Comprehension, trade vocabulary, and abstracting
Writing	Write manufacturing notes	Spelling, footnoting, usage, clarity of expression Reading technical manuals [Standards books] [Machinists handbook] [Architectural graphic standards] Library information Classification

(TASK STATEMENT) DETERMINE THE NEED OF ADDITIONAL VIEWS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Draftsman's value judgment	Look at drawing closely Determine if all features are shown and indicated properly If not determine what additional views would be necessary Sections Views Details Auxilaries Other principle views KNOWLEDGE Must be able to recognize when an object has been fully detailed including dimensions Know various additional view methods	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine if additional views are needed or if drawing conveys the part as presented	The draftman's sole responsibility is to show in its entirety the item to be manufactured; many times a draftsman must make additional views to convey the total amount of detail required to make the part	Incomplete drawing detail Compounding additional cost Lost time

TASK STATEMENT) DETERMINE THE NEED OF ADDITIONAL VIEWS

SCIENCE	MATH – NUMBER SYSTEMS
	Ratio and proportion Measures of length Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Sectioning symbols]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards books and reference material	Comprehension Trade terminology

(TASK STATEMENT) PLACE MARGINAL INFORMATION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table, drawing board and surface, chair (posture type), light tables, T-square, parallel straight edge, triangles (30°-60° and 45°) adjustable triangles, scales, protractors, curves, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing linen, tracing film, scratch pad, dusting brush, artype, mericode, calculator, adding machine, slide rule, leroy set, wrico set, varityper, lettering guide, various reference books, standards books, tracing paper	Locate proper area to place information Construct needed line work Darken in lines Select proper title headings, abbreviations, and terms Letter in marginal information Check work Submit detail drawings to checker KNOWLEDGE Where to place information Line work and line weight Marginal information terminology Proper lettering techniques Various optional lettering devices Available standards book	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Decide if any marginal information is needed Decide where to place marginal information	Marginal information must be as accurate as main body of the drawing Never sacrifice neatness in marginal information Readibility, appearance	Incomplete drawing information or information in a difficult location

(TASK STATEMENT) PLACE MARGINAL INFORMATION

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark, rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Measures of length Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Reference books such as the machinery handbook	Library information Comprehension Trade vocabulary Abstracting
Writing	Manufacturing notes, engineering notes, and heat treating information	Spelling Footnoting Usage Clarity of expression

Duty J Drawing Assemblies

1 Select type of assembly
2 Determine sheet size and part scale
3 Select media to use
4 Draw and dimension assemblies
5 Determine need of additional views or sub-assemblies
6 Determine part code
7 Shade drawings

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(TASK STATEMENT) SELECT TYPE OF ASSEMBLY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Erasers Pencils Pencil sharpener Various reference books Standards books Calculators Adding machine Slide rule Scratch pad	Check standards books Determine use of drawing Make calculations necessary in selecting the drawing method Make sketches of part by various methods KNOWLEDGE Available standards book Operate calculating equipment Various ways of drawing details [Example: isometric, sectioned orthographic, etc.] How drawing will be used Who will use drawing	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pumice and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Decide the type of assembly particular assembly line workers are able to read	The training this group has had in blue print reading In drawing the assemble the draftsman must depict all mating parts in a manner that facilitates the assemble process	A print that the assembly group cannot work from

(TASK STATEMENT) SELECT TYPE OF ASSEMBLY

SCIENCE	MATH – NUMBER SYSTEMS
	Monetary system Measure of time and speed (Example: time-seconds, minutes, etc.; speed-feet per minute, R.P.M., etc.) [Estimation of time] Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Trade instructional materials, standards books	Comprehension Trade terminology

(TASK STATEMENT) DETERMINE SHEET SIZE AND PART SCALE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Erasers Pencils Pencil sharpener Scratch pad Various reference books Standards books Calculator Adding machine Slide rule	Operate calculating equipment Check standards books With dividers, scale, and compass, determine the size of the object to be drawn KNOWLEDGE Drawing sheet sizes Various scales Needed proportions of object to be drawn	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine size of drawing needed and scale of part	In selecting the proper scale and sheet size the draftsman should keep in mind what method is being used and be aware that different methods shown properly, require different scales Readibility, use of drawing	A poor quality print Difficult to read Loss of sho. time Adding additional cost to the company

(TASK STATEMENT) DETERMINE SHEET SIZE AND PART SCALE

SCIENCE	MATH – NUMBER SYSTEMS
	Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Multiplication and division of decimal fractions Addition and subtraction of decimal fractions Measures of length Ratio and proportion

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards book and trade instructional material	Comprehension Trade terminology

(TASK STATEMENT) SELECT MEDIA TO USE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Erasers Pencils Pencil sharpener Pens Drawing paper or poster board Tracing paper Vellum Tracing linen Tracing film Artype Leroy set Wrico set Varityper Various reference books Standards books Scratch pad	Check standards books Make calculations Check on drawings use and by whom Check reproduction methods available KNOWLEDGE Pencil lead weights Pen types and sizes Standard sheet sizes Qualities of various materials available Lettering techniques Optional lettering devices	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of edges and points of equipment Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine what type of material to draw on and the method of doing linework	Select medias that allow the drawing to perform its function without sacrificing drawing time, reproduction time and in general, company cost	Poor print quality resulting in lost time and additional cost

(TASK STATEMENT) SELECT MEDIA TO USE

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Locate by approximation rational numbers and integers on the number line (sequential ordering)

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Standards book, trade instructional material	Comprehension Trade terminology

(TASK STATEMENT) DRAW AND DIMENSION ASSEMBLIES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°- 60° and 45°) adjustable triangles, scales, protractors, curves, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), dividers, pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, dusting brush, artype, calculators, adding machines, slide rules, leroy set, wrico set, varityper, lettering guide, various reference books, standards books	Mount drawing Organize individual part layouts Construct all individual detail parts which make up the total assembly Check mating of all parts Darken in views Add needed dimensions Check work KNOWLEDGE Available reference and standards books Construction line weights Pencil leads and pen sizes Line work and line weight Tolerance and sizes of mating parts Critical assembly dimensions Any needed reference dimensions	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Lubricants and solvents splashing in eyes Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Determine best part sequence in assembly	Know the proper sequence of mating part assembling Constantly check assembly dimensions Draw assembly by using detail parts as reference, this serves as a double check against any error	Lost time in the assembly process

(TASK STATEMENT) DRAW AND DIMENSION ASSEMBLIES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark, rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Measures of length Addition, subtraction, division, and multiplication of whole numbers Addition, subtraction, division, and multiplication of proper and improper fractions Addition, subtraction, division, and multiplication of decimal fractions Measure with the Metric and English system and convert between them Given an instrument of measure, determine precision, and/or accuracy with respect to relative error, tolerance, and significant digits (Measuring other than linear, square, and cubic) [Tolerances] Ratio and proportion Read and interpret charts, tables, and/or graphs [Guide for selecting tolerances, cylindrical fits, contour tolerance symbols]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Read reference material such as machinery's handbook and trade manual	Comprehension, trade vocabulary, abstracting
Writing	Write assembly notes and marginal information	Spelling, footnoting, usage, clarity of expression, technical manuals, library information, classification

(TASK STATEMENT) DETERMINE NEED OF ADDITIONAL VIEWS OR SUB-ASSEMBLIES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Draftsman value judgment	Look closely at assembly Determine if all parts are shown Determine if all fasteners are included Check to see if any important assembly information is obscured by the drawing method used Draw any additional views needed [Views, sections, details, auxilaries] <u>KNOWLEDGE</u> Be able to recognize when an assembly feature is not fully shown Fastener types All parts that make up assembly Various methods of showing additional views	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Adequate foot candles of lighting (20 foot candles minimum) Be aware of equipment points and edges Pounce and erasing powder in eyes
DECISIONS	**CUES**	**ERRORS**
Decide if drawing is complete	The purpose of the assembly is to show individuals how to assemble a whole from parts; it is the draftsman's responsibility to insure that this can be done properly from assembly drawing, often additional views are needed	The assembly time will be in excess if the inability to assemble the product results from an incomplete drawing

(TASK STATEMENT) DETERMINE NEED OF ADDITIONAL VIEWS OR SUB-ASSEMBLIES

SCIENCE	MATH – NUMBER SYSTEMS
	Ratio and proportion Measures of length Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal [Sectional symbols]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Work orders, work request, standards books and trade manuals	Comprehension Trade terminology

(TASK STATEMENT) DETERMINE PART CODE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Pencils Erasers Pencil sharpener Scratch pad Calculator Adding machine Slide rule Various reference books Standards books	Check standards books for company standards Place guidelines or containing lines on drawing Letter in part code Check to insure part code matches detail codes, names or numbers Darken lines Check work KNOWLEDGE Available standard books Pencil leads and pen sizes Line work and line weight Proper lettering practices Various alternate lettering devices Efficient ways of coding assemblies [Example: number, item number, letters, etc.]	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Be aware of equipment points and edges Adequate foot candles of lighting (20 foot candles minimum) Pounce and erasing powder in eyes Lubricants and solvents splashing in eyes
DECISIONS	**CUES**	**ERRORS**
Determine what method would best show the coding or sequence of assembly	A code is not used to facilitate drafting but rather to help those putting the assembly together; if a coding system does not add efficiency to assembly it should not be used	Lost time in assembly process

(TASK STATEMENT) DETERMINE PART CODE

SCIENCE	MATH – NUMBER SYSTEMS
	Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers

COMMUNICATIONS		
PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Parts list and sequence of assembly information	Classification Comprehension Trade terminology Clarity of expression Abstracting Spelling Editing and profreading

(TASK STATEMENT) SHADE DRAWINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Light table, T-square, parallel straight edge, triangles (30-60 and 45), adjustable triangles, curves, drafting templates (various), drafting machines, erasing shield, erasers, pencils, pencil sharpener, compass (bow and beam), pens, inks, erasing powder, pounce, cleaning cloth, tape, drawing paper or poster board, tracing paper, vellum, tracing linen, tracing film, scratch pad, scissors, standards books, various reference books, pastels, charcoals, paper stump, lettering guide	Determine if shading will contribute to assembly Determine most advantageous light source Shade areas obscured from light Blend intermediate areas Check work KNOWLEDGE Medias used in shading (pastels, pencils, ink, etc.) Perspective or cone of visual rays Curved and oblique surfaces Use of assembly	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Ground all electrical equipment Be aware of equipment points and edges Adequate foot candles of lighting (20 foot candles minimum) Pounce and erasing powder in eyes Lubricants and solvents splashing in eyes
DECISIONS	**CUES**	**ERRORS**
Determine if shading is needed based on drawings' usage	Shading of assembly drawings serve several possible functions , as well as beautifying a drawing it serves to show more pictorially the object as it appears to the eye; it shows the third dimension of depth on a two dimensional drawing	Drawing does not meet the requirements of its usage

(TASK STATEMENT) SHADE DRAWINGS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage Differences in absorption and radiation of energy between dark, rough surfaces and light, smooth, polished surfaces Composition of matter, including protons, neutrons, electrons, atoms, molecules, elements Effects of friction on work processes and product quality	Locate by approximation rational numbers and integers on the number line (sequential ordering) Ratio and proportion [Relation to light source] Determination of area, perimeter and diagonals of quadrilaterals (4 sided figures) Determination of area, perimeter and diagonals of polygons with more than 4 sides

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Work requests, job orders, and trade instruction information	Comprehension Trade terminology Library information Classification

Duty K Checking Drawings

1 Supervise group
2 Record and assign work to group
3 Check work completed by group
4 Submit reports to coordinator

(TASK STATEMENT) SUPERVISE GROUP

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Pencils Pens Pencil sharpener Erasers Scratch pad Calculator Adding machine Slide rule Catalog files Card files Listing file Memorandum sheets Book cases Stapler Gummed reinforcements Staples Staple remover Brass clips Prestungs (paper fasteners) Request forms Various reference books Standards books Drafting table Chair (posture type)	Greet visitors Conduct interviews Write evaluations and recommendations Set example for sub-ordinates Be aware of situations in and around your area KNOWLEDGE Required skills in area Know personnel well enough to evaluate Your influence on others	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural light Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in are of responsibility
DECISIONS	**CUES**	**ERRORS**
Determine what supervisory actions influence subordinate behavior	Absenteeism, tardiness, and inefficiency on the part of the checker leads to inefficiency in his/her group ; have neat and commanding appearance	Lack of proper respect from sub-ordinates Inefficiency due to lack of motivation set by supervisor's example

(TASK STATEMENT) SUPERVISE GROUP

SCIENCE	MATH – NUMBER SYSTEMS
Knowledge of all physical sciences in lesser duties	Knowledge of all math recorded in lesser duties

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	Talking with others about an individual personal problems on occasion if the need arises	Poise Enunciation Persuasion Leadership training
Writing	Writing evaluations of subordinates	Process reports and instructions (oral and informal) Progress reports (oral and informal) Recommendation reports Determining audience level Diction Clarity of expression Usage, vocabulary, spelling
Reading	Reading progress reports	Comprehension

(TASK STATEMENT) RECORD AND ASSIGN WORK TO GROUP

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table Standards books Chair (posture type) Erasers Pencils Pencil sharpener Pens Scratch pad Calculator Adding machine Slide rule Card files Listing file Memorandum sheets Storage cabinets Book cases Gummed reinforcements Stapler, staples, staple remover Brass clips Prestungs (paper fasteners) Request forms Various reference books	Record work assigned by coordinator Assign and record work to draftsman Log drawings assign to other areas [Example: reproduction department] Log work checking Sign off on all drawings completed and record Submit completed work to coordinator KNOWLEDGE Status of all jobs assigned to area at all times Good record keeping techniques	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural light Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in area of responsibility
DECISIONS	**CUES**	**ERRORS**
Determine work load, organization	Inefficient records lead to lost time and drawings	Discontent of some subordinate who may carry the work load

(TASK STATEMENT) RECORD AND ASSIGN WORK TO GROUP

SCIENCE	MATH – NUMBER SYSTEMS
	Knowledge of time estimation Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of decimal fractions Multiplication and division of decimal fractions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Writing	Create an organization chart which balances the work load by distributing work equally	Classification Logic Clarity of expression Progress reports Usage Vocabulary Spelling Conciseness

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(TASK STATEMENT) CHECK WORK COMPLETED BY GROUP

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table, drawing board and surface, chair (posture type), light table, T-square, parallel straight edge, triangles (30°-60° and 45°) scales, adjustable triangles, protractors, curves, drafting templates (various), drafting machines, pencils, pencil sharpener, compass (bow and beam), dividers, pens, tape, scratch pad, calculator, adding machine, slide rule, catalog files, memorandum sheets, various reference books, standards books, xerox	Log in work from draftsman Completely check all work done by workers Sign off on drawing Log work out Submit work to coordinator KNOWLEDGE All drafting standards used by department Marked blueprint reading Good record keeping Good work habits	Safety awareness is important because a draftsman is often required to work in shops or on job istes where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural light Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in area of responsibility
DECISIONS	**CUES**	**ERRORS**
Decide if work is correct before it leaves department	Checking time should take one-forth to one-third drawing time if done properly Color pencil aids to good checking [Red-add, yellow-remove, blue or green -satisfactory]	The people doing the work will have a poor opinion of supervisor and department; it will also cost money and waste time if work has to be done again after distribution

(TASK STATEMENT) CHECK WORK COMPLETED BY GROUP

SCIENCE	MATH – NUMBER SYSTEMS
Knowledge of all physical sciences recorded in lesser duties	Knowledge of all math recorded in lesser duties

COMMUNICATIONS		
PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	All marginal information on a drawing, all dimensions and footnotes The work request to insure the job met its requirements	Trade vocabulary Comprehension

(TASK STATEMENT) SUBMIT REPORTS TO COORDINATOR

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table Standards books Chair (posture type) Erasers Pencils Pencil sharpener Pens Scratch pad Calculator Adding machine Slide rule Card files Listing file Memorandum sheets Storage cabinets Book cases Gummed reinforcements Stapler, staples, staple remover Brass clips Prestungs (paper fasteners) Request forms Various reference books	A checker may be called upon to submit oral and written reports to his/her coordinator both in a formal and informal manner [Example: Efficiency, progress, status, attendance and evaluation etc.] KNOWLEDGE Refer to communications cell	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural light Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in area of responsibility
DECISIONS	**CUES**	**ERRORS**
Determine if report is needed	Accurate reports are an indication of an individual's efficiency in supervising a group	If report is not needed, time is lost by the checker and the coordinator

(TASK STATEMENT) SUBMIT REPORTS TO COORDINATOR

SCIENCE	MATH – NUMBER SYSTEMS
	Development of graphs comparing two complimentary sets of figures Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of decimal fractions Multiplication and division of decimal fractions Changing percents to fractions and fractions to percents Finding a percent of a number and what percent one number is of another

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Writing	A progress report of drafting group or of job's progress Recommend subordinates for advancement	Progress reports (oral, written, or informal) Recommendation reports (oral, written, or informal) Process reports and instructions Proposal writing Spelling
Speaking	Recommend subordinates for advancement	Determine audience level Diction, vocabulary, clarity of expression, usage, conciseness Enunciation Poise Persuasion Logic and organization

Duty L Co-ordinating Drafting Department

1 Supervise drafting department
2 Record and assign work to checkers
3 Liason between engineer and draftsman
4 Submit reports to higher supervision
5 Order and inventory materials and supplies

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(TASK STATEMENT) SUPERVISE DRAFTING DEPARTMENT

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Erasers, pencils, pencil sharpener, pens, scratch pad, calculator, adding machine, slide rule, catalog files, card files, listing files, memorandum sheets, book cases, gummed reinforcements, stapler, staples, staple remover, brass clips, prestungs (paper fasteners), request forms, various reference books, standards books, drafting table, chair (posture type)	Greet visitors Conduct interviews Write evaluations and recommendations Set example for subordinates Be aware of situations in and around the drafting department KNOWLEDGE Required skills in area Know personnel well enough to evaluate Influence on others	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural light Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in area of responsibility
DECISIONS	**CUES**	**ERRORS**
Decide on organization structure Adjust structure to meet needs of department	Absenteeism, tardiness and inefficiency on the part of the coordinator leads to inefficiency in department Have neat and commanding appearance	Greatest error is not being able to accept that selection was wrong or that decision was poor and are unwilling or unable to change it

(TASK STATEMENT) SUPERVISE DRAFTING DEPARTMENT

SCIENCE	MATH – NUMBER SYSTEMS
Knowledge of all physical sciences recorded in lesser duties	Knowledge of all math recorded in lesser duties

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	Oral reports to higher supervision, interview subordinates	Poise, enunciation, persuasion Leadership training
Writing	Writing formal progress reports	Progress reports (formal, informal, or written) Process reports and instruction Recommendation reports Determining audience level Diction and clarity of expression Usage
Reading	Reading memos, work requests, etc.	Vocabulary Comprehension Spelling

(TASK STATEMENT) RECORD AND ASSIGN WORK TO CHECKERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Drafting table Chair (posture type) Erasers Pencil sharpener Pens Scratch pad Calculator Adding machine Slide rule Card files, listing file Memorandum sheets Storage cabinets Book cases Gummed reinforcements Stapler, staples, and staple remover Brass clips Prestungs (paper fasteners) Request forms Various reference books Standards books	Record work from engineer Assign and record work to checker Log drawings assigned to other areas Record and assign off all drawings completed in your area Route completed work back to engineer KNOWLEDGE Know the status of all jobs assigned to your area at all times Good record keeping and techniques	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural lighting Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in area of responsibility
DECISIONS	**CUES**	**ERRORS**
Determine if work load is being distributed equally	Inefficient record keeping leads to lost time and often lost drawings	Morale declines when work is not balanced

(TASK STATEMENT) RECORD AND ASSIGN WORK TO CHECKERS

SCIENCE	MATH – NUMBER SYSTEMS
	Knowledge of time (estimation) Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of decimal fractions Multiplication and division of decimal fractions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Writing	Create organization chart and work flow chart to balance distribution of work equally	Classification Logic Clarity of expression Progress reports Usage Vocabulary Conciseness Spelling

(TASK STATEMENT) LIASON BETWEEN ENGINEER AND DRAFTSMAN

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table Chair (posture type) Erasers Pencils Pencil sharpener Pens Scratch pad Calculator Adding machine Slide rule Catalog files and listing file Memorandum sheets Book cases Gummed reinforcements Stapler, staples, staple remover Brass clips Prestungs (paper fasteners) Request forms Various reference books Standards books Storage cabinets	One of the primary functions of the coordinator is to serve as liason between the draftsman and the engineer; included in this task would be interpreting engineering data and reporting the drawing status to the engineer, etc. KNOWLEDGE See communications cell	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural lighting Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in area of responsibility
DECISIONS	**CUES**	**ERRORS**
Determine if communication between engineer and draftsman is needed	The ability to adjust to various levels of communication is essential	Do not interfer when not needed, give draftsman some authority along with his/her job responsibility

(TASK STATEMENT) LIASON BETWEEN ENGINEER AND DRAFTSMAN

SCIENCE	MATH – NUMBER SYSTEMS
Knowledge of all physical sciences used by lesser drafting duties and some knowledge of physical science used by the engineering profession	Knowledge of all math used by lesser drafting duties and some knowledge of math used by the engineering profession

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Speaking	Communication with engineer and draftsman	Trade terminology Public speaking [Poise, enunciation, persuasion, usage, diction]
Writing	Communication with engineer and draftsman	Composition [Diction and connotative words (tact)] Clarity of expression Organization Verbal reports Details and inference Logic, spelling, usage Conciseness
Reading		Comprehension

(TASK STATEMENT) SUBMIT REPORTS TO HIGHER SUPERVISION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table Chair (posture type) Erasers Pencils Pencil sharpener Pens Scratch pad Calculator Adding machine Slide rule Xerox Memorandum sheets Storage cabinets Book cases Gummed reinforcements Stapler, staples, staple remover Brass clips Prestungs (paper fasteners) Request forms Various reference books Standards books	A coordinator may be called upon to submit oral and written reports to higher supervision both in a formal and informal manner [Example: efficiency, progress status, attendance and evaluation, etc.] KNOWLEDGE Refer to communications cell	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural light Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in area of responsibility
DECISIONS	**CUES**	**ERRORS**
Determine if report is needed	Accurate reports are an indication of an individual's efficiency in supervising a group	Wasted time by self and supervisor if report is not necessary

(TASK STATEMENT) SUBMIT REPORTS TO HIGHER SUPERVISION

SCIENCE	MATH – NUMBER SYSTEMS
	Development of graphs comparing two complimentary sets of figures Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of decimal fractions Multiplication and division of decimal fractions Changing percents to fractions and fractions to percents Finding a percent of a number and what percent one number is of another

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Writing	Read reports by subordinate Write reports to higher supervisors such as progress reports, recommendation reports, etc.	Progress reports (formal) Recommendation reports (formal) Process reports and instructions Proposal writing Spelling Determine audience level Diction and vocabulary Clarity of expression, usage Conciseness, enunciation Poise Persuasion Logic Organization

(TASK STATEMENT) ORDER AND INVENTORY MATERIALS AND SUPPLIES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Drafting table Standards books Chair (posture type) Pencils Various reference books Erasers Pencil sharpener Pens Scratch pad Xerox Calculator Adding machine Slide rule Catalog files, listing file Card files Memorandum sheets Storage cabinets Book cases Gummed reinforcements Stapler, staples, staple remover Brass clips Prestungs (paper fasteners) Request forms	Check with sub-ordinates to determine their needs Keep a running inventory Create list of suppliers Fill out requisitions Check in all incoming supplies and invoices Make check out and use charts and cards on all consumable materials and supplies KNOWLEDGE Of files Bookkeeping skills Of all materials and supplies in your department Of all suppliers Of most common breakdown areas and order ahead	Safety awareness is important because a draftsman is often required to work in shops or on job sites where numerous safety hazards exist during any phase of his/her work Place desk to gain advantage of artificial and natural light Adequate foot candles of lighting (20 foot candles minimum) Check constantly all possible safety hazards in your area of responsibility
DECISIONS	**CUES**	**ERRORS**
Determine when and where to order supplies	Do not wait until you are out of supplies to order Use suppliers that service their equipment and ones that take an interest in your needs	Lost time, out of supplies Supplier unreliable and carrying inferior equipment or supplies

(TASK STATEMENT) ORDER AND INVENTORY MATERIALS AND SUPPLIES

SCIENCE	MATH – NUMBER SYSTEMS
	Locate by approximation rational numbers and integers on the number line (sequential ordering) Addition and subtraction of whole numbers Multiplication and division with whole numbers Addition and subtraction of decimal fractions Multiplication and division of decimal fractions Addition and subtraction of proper and improper fractions Multiplication and division of proper and improper fractions Liquid and dry measures Measures of length and weight Given a coding system, recognize and identify each unit involved by assigning necessary symbols, numerical or literal Read and interpret charts, tables, and/or grpahs

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Supply catalogs, specifications, standards books	Trade terminology, comprehension
Writing		Penmanship Organization and classification Content Letter of inquiry Order letter Letter of adjustment Business letter format
Speaking	Telephone communications	Clarity of expression Usage