DOCUMENT RESUME

ED 107 956 95 CE 004 169

AUTHOR McKinney, Oral O.; And Others
TITLE An Analysis of the Carpentry Occupation.
INSTITUTION Ohio State Dept. of Education, Columbus. Div. of Vocational Education.; Ohio State Univ., Columbus. Trade and Industrial Education Instructional Materials Lab.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
PUB DATE [75]
NOTE 124p.; For related documents, see CE 004 160-168, CE 004 170-206, CE 004 263-268, and CE 004 425-427

EDRS PRICE MF-$0.76 HC-$5.70 PLUS POSTAGE
DESCRIPTORS Building Trades; *Carpenters; Communication Skills; *Job Analysis; Knowledge Level; *Occupational Information; Safety; Skill Analysis; Skill Development; Skilled Occupations; *Task Analysis; Task Performance; Work Attitudes

ABSTRACT

The general purpose of the occupational analysis is to provide workable, basic information dealing with the many and varied duties performed in the carpentry occupation. The analysis starts with the progress of a house from the first study of the blueprints to the laying out of the excavations and continuing step-by-step until the interior finish is applied to the completed structure. The document opens with a brief introduction followed by a job description. The bulk of the document is presented in table form. Ten 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: surveying; footing and foundation walls; framing floors, walls and ceilings, and roofs; roofing; exterior finish; insulation; interior trim; and stairs. The two appendixes consist of list of basic arithmetic skills and concepts, and carpentry tools and equipment. (BP)

CARPENTRY

Instructional Materials Laboratory
Trade and Industrial Education
Ohio State University

5151

AN ANALYSIS OF THE CARPENTRY OCCUPATION

Developed By

Oral O. McKinney
Instructor, Carpentry
Patterson Coop High School
Dayton, Ohio

Carl A. Nordvig
Instructor, Carpentry
Licking County J.V.S.
Newark, Ohio

Dick Emery
Consultant
Carpenter
Columbus, Ohio

Occupational Analysis
E.P.D.A. Sub Project 73402
June 1, 1973 to December 30, 1974
Director: Tom L. Hindes
Coordinator: William L. Ashley

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

"The activity which is the subject of this report was supported in whole or in part by the U.S. Office of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

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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

The purpose of developing this task analysis of the carpentry trade is to provide a detailed and orderly sequence in the process of developing the necessary concept and skills of an individual to become proficient in this trade.

This analysis takes in the scope of the basic skills that are necessary to function as a carpenter employed in residential construction.

This analysis starts with the progress of a house from the first study of the blueprints to the laying out of the excavations and continuing step by step until the interior finish is applied to the completed structure.

Individuals may find items with which they do not completely agree. Many problems are solved daily on the job by procedures that differ between workers in the same area and differ more between workers in various parts of the country.

ACKNOWLEDGMENT

We wish to acknowledge the valuable assistance rendered by the following subject matter specialists. They provided input to the vocational instructors in identifying related skills and concepts of each respective subject matter area and served as training assistants in the analysis process during the two-week workshops.

Rollin M. Barber, Psychology
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

Acknowledgment is extended to the following I.M.L. staff members for their role in conducting the workshops; editing, revising, proofing and typing the analyses.

Faith Justice	Research Associate
Sheila Nelson	Administrative Assistant
Marsha Opritza	Editorial Consultant
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

The term carpentry refers to the cutting, fitting and assembling of wood or related materials in the construction of residential buildings and many other types of structures made from similar materials. Throughout many successive periods of history, carpentry has maintained a prominent position in the construction of buildings and still remains as one of the most important areas of the building trades. Many new materials have taken places along with wood in construction work and are installed by carpenters. Carpentry has had to expand to include skills and techniques which were not even thought of a generation ago. Architects and engineers have developed structures which have tested the ability and ingenuity of builders. The carpenter has had to come up with the ways and means to construct these buildings.

The carpenter is involved in almost every phase of erecting a home or any other type of building. He/she provides the formwork for footings and foundations; builds a sound basic structure from the first study of the blueprints to the installation of sills, floors, walls, and roof; builds and installs cabinets and trims the house inside and out; and prepares the way for other workers and works closely with them. The carpenter knows the materials used and is able to shape them with precision, using hand and power tools.

The carpenter must have a wide background in building methods and must be able to work and coordinate activities with other workers. He/she must meet the challenge of specialization and mass production.

Duty A Surveying

1 Layout buildings (instrument method)
2 Erect batter boards
3 Layout driveway
4 Layout building columns for commercial building

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(TASK STATEMENT) LAYOUT BUILDINGS (INSTRUMENT METHOD)

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Level transit Tripod Metal tapes Sledge hammer Plumb bob Eye magnifying glass Wood stakes Crayon Flags Plot plan blueprint Nails Claw hammer Foundation plan Building codes	Read plot plan, foundation plan Set up transit on corner stake Tape measurement for length Turn 90 degree angle, mark stake Reset instrument on second, third stake Check by turning back to stake one	Safety Always carry the instrument with the points of the tripod pointing downward Hazard Puncturing someone with the points Wear hard hat, safety glasses and safety shoes
DECISIONS	**CUES**	**ERRORS**
Determine placement of first stake Determine accuracy of layout (3,4,5 method)	Plot plan, foundation plan, building codes, distance between points on first stake	Modes Wrong placement Incorrect readings setting up instrument

ASK STATEMENT) LAYOUT BUILDINGS (INSTRUMENT METHOD)

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational numbers–positives (fractions) Use of numbers (without calculation) - counting, coordinate system, ordering, indexing, coding [degrees in surveying] Basic arithmetic skills and concepts (see appendix) Use of computing devices and mechanical aids–slide rule [concrete] Basic measurement skills and concepts: measure sense/role of unit; measurement: geo c (linear, area, angle); read and interpret tables, ts and graphs (scale drawings/floor plans/bluep , maps) Use of variables in formulae agorean triples for check of squareness and accuracy, -5 method]; manipulation of formulae; substitute given values in order to find the value of the required unknown; solve problems involving literal algebraic expressions [Pythagorean theorem] Recognize and identify basic geometry figures: plane Knowledge of geometric relationships; determination of area and volume of rectangular, cube and right triangular prisms Geometric constructions [plumb bob, transit] Basic logic: deductive or inductive [sequence of layout]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) ERECT BATTER BOARDS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Sledge hammer Stakes 1'' x 6'' boards Hand saw Dry line Metal tapes Crayon Flags Level transit Builders level Level rod Plumb bob Nails Tripod	Erect batter board stakes Transfer height of foundation wall of building to batter board stakes Nail top of ledger board to foundation height Transfer building lines with level transit to ledger boards Cut kerf for building lines Attach dryline to kerfs Check diagonals where drylines cross	Safety Wearing safety hats when driving stakes Check hammer handles Hazard Possible injury to head or hands Wear hard hats, safety glasses, safety shoes
DECISIONS	**CUES**	**ERRORS**
Using transit or plumb bob method What distance the batter boards should be from the building line	What precision needed Check with excavating contractor	Inaccurate layout Batter boards too close to excavating

TASK STATEMENT) ERECT BATTER BOARDS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational numbers–positives (fractions) Use of numbers (without calculation) – counting, coordinate system, ordering, indexing, coding [degrees in surveying] Basic arithmetic skills and concepts (see appendix) Use of computing devices and mechanical aids–slide rule [concrete] Basic measurement skills and concepts: measure sense/role of unit; measurement: geometric (linear, area, angle); read and interpret tables, charts and graphs (scale drawings/floor plans/blueprints, maps) Use of variables in formulae [Pythagorean triples for check of squareness and accuracy, 3-4-5 method]; manipulation of formulae; substitute given values in order to find the value of the required unknown; solve problems involving literal algebraic expressions [Pythagorean theorem] Knowledge of geometric relationships; determination of area and volume of rectangular, cube and right triangular prisms Geometric constructions [plumb bob, transit] Recognize and identify basic geometry figures: plane Basic logic: deductive or inductive [sequence of layout]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) LAYOUT DRIVEWAY

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Level transit Level rod Plumb bob Stakes Lumber Nails Tripod Blueprint Sledge hammer Claw hammer Tapes Dry lines Building codes	Read blueprint Locate one side of driveway Check excavation Place stakes Square up sides Shoot elevations Place forms	Safety Checking tools to be sure that they are in good working condition Hazard Loose hammer handles Wear hard hats, safety glasses, safety shoes

DECISIONS	CUES	ERRORS
Determine placement and slope	Land contour	Improper slope for drainage

ASK STATEMENT) ERECT BATTER BOARDS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter, (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational numbers–positives (fractions) Use of numbers (without calculation) – counting, coordinate system, ordering, indexing, coding [degrees in surveying] Basic arithmetic skills and concepts (see appendix) Use of computing devices and mechanical aids–slide rule [concrete] Basic measurement skills and concepts: measure sense/role of unit; measurement: geometric (linear, area, angle); read and interpret tables, charts and graphs (scale drawings/floor plans/blueprints, maps) Use of variables in formulae [Pythagorean triples for check of squareness and accuracy, 3-4-5 method]; manipulation of formulae; substitute given values in order to find the value of the required unknown; solve problems involving literal algebraic expressions [Pythagorean theorem] Knowledge of geometric relationships; determination of area and volume of rectangular, cube and right triangular prisms Geometric constructions [plumb bob, transit] Recognize and identify basic geometry figures: plane Basic logic: deductive or inductive [sequence of layout]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) LAYOUT BUILDING COLUMNS FOR COMMERCIAL BUILDINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Transit Tripod Crayon Scratch awl Metal tape	Read blueprint Find outside center lines of building north and south Measure and scribe center lines on all outside columns Set up instrument on center line of column Shoot lines on column forms Check by measuring from outside column Repeat above procedure east and west on columns	Safety Hard hats must be worn at all times Hazard Object falling from above Wear hard hats, safety glasses, safety shoes

DECISIONS	CUES	ERRORS
What measurements to use for center lines of outside column	Measurements correspond with blueprints	Inaccurate measurements

ASK STATEMENT) LAYOUT BUILDING COLUMNS FOR COMMERCIAL BUILDINGS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational numbers–positives (fractions) Use of numbers (without calculation) – counting, coordinate system, ordering, indexing, coding [degrees in surveying] Basic arithmetic skills and concepts (see appendix) Use of computing devices and mechanical aids–slide rule [concrete] Basic measurement skills and concepts: measure sense/role of unit; measurement: geometric (linear, area, angle); read and interpret tables, charts and graphs (scale drawings/floor plans/blueprints, maps) Use of variables in formulae [Pythagorean triples for check of squareness and accuracy, 3-4-5 method]; manipulation of formulae; substitute given values in order to find the value of the required unknown; solve problems involving literal algebraic expressions [Pythagorean theorem] Recognize and identify basic geoemtry figures: plane Knowledge of geometric relationships; determination of area and volume of rectangular, cube and right triangular prisms Geometric constructions [plumb bob, transit] Basic logic: deductive or inductive [sequence of layout]

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

Duty B Footing and Foundation Walls

1 Layout footer forms and column bases
2 Cut and erect footer forms and column bases
3 Layout and install foundation forms
4 Apply waterproofing
5 Construct slab on ground construction
6 Construct entrance platforms and steps
7 Layout and install sidewalks and drives

(TASK STATEMENT) LAYOUT FOOTER FORMS & COLUMN BASES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Hand tools Surveying equipment Saw horses	Read blueprint Mark proper location of forms	Safety Wear hard hat, safety glasses, safety shoes Stabilize ladder Hazard Flying and falling objects Falling off ladder

DECISIONS	CUES	ERRORS
Correct location	Blueprint	Too close to property line Building not square

(TASK STATEMENT) LAYOUT FOOTER FORMS & COLUMN BASES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational - positive fractions Use of numbers (without calculation) [ordering-measuring] Basic arithmetic skills and concepts [see appendix] Use of computing devices and mechanical aids [slide rule-concrete] Basic measurement skills and concepts: measure sense/role of unit; instruments [ruler]; rate [feet, square ft., cubic yards]; measurement: non-geometric [time, money, temperature, weight]; conversion from one standard unit to another Use of variables in formulae [volume] manipulation of formulae [L.W.T.]; substitute given values in order to find the value of the required unknown Determination of area & volume of rectangular, cube & right triangular prisms; geometric constructions [plumb bob] Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint and specifications	Detail/inference
	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) CUT AND ERECT FOOTER FORMS AND COLUMN BASES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Hand tools Surveying equipment Fastening devices Ladder Saw horse	Read blueprint Cut and erect forms Excavate for concrete	Safety Wear hard hat, safety glasses, safety shoes Stabilize ladder Hazard Flying or falling objects Falls

DECISIONS	CUES	ERRORS
Correct location	Blueprint	Too close to property lines, not square
Correct depth	Blueprint	Footings crack
Adequate bracing	Width of footer	Form give way, waste material
Correct dimension	Blueprint	Not square, will not conform to code

(TASK STATEMENT) CUT AND ERECT FOOTER FORMS AND COLUMN BASES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion of concrete] Forces acting on a body immersed or floating in a liquid [expansion joints] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Effects of friction on work processes and product quality [strength of concrete] Resistance of materials to change in shape	Rational - positive fractions Use of numbers (without calculation) [ordering-measuring] Basic arithmetic skills and concepts [see appendix] Use of computing devices and mechanical aids [slide rule-concrete] Basic measurement skills and concepts: measure sense/role of unit, instruments [ruler]; rate [feet, sq. ft., cubic yards]; measurement: non-geometric [time, money, temperature, weight]; conversion from one standard unit to another Use of variables in formulae [volume]; manipulation of formulae [L.W.T.]; substitute given values in order to find the value of the required unknown Determination of area & volume of rectangular, cube & right triangular prisms; geometric constructions [plumb bob] Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint and specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) LAYOUT AND INSTALL FOUNDATION FORMS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Hand tools Surveying equipment Materials Fastening devices Ladder Saw horse	Read blueprint and layout Cut material Install forms Correct bracing Correct dismantling	Wear hard hat, safety glasses, safety shoes, stabilize the ladder Hazard Flying and falling objects Falling
DECISIONS	**CUES**	**ERRORS**
Determine location, size, bracing, proper method of dismantling forms	Blueprint Type of forms	Too close to properly line Too large or too small Forms give way waste materials Broken form

ASK STATEMENT) LAYOUT AND INSTALL FOUNDATION FORMS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials [expansion of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [warping - twisting materials]	Rational - positive fractions Use of numbers (without calculation) [ordering-measuring] Basic arithmetic skills and concepts [see appendix] Use of computing devices and mechanical aids [slide rule-concrete] Basic measurement skills and concepts: measure sense/role of unit; instruments [ruler]; rate [feet, sq. ft., cubic yards]; measurement: non-geometric [time, money, temperature, weight]; conversion from one standard unit to another Use of variables in formulae [volume]; manipulation of formulae [L.W.T.]; substitute given values in order to find the value of the required unknown Determination of area & volume of rectangular, cube & right triangular prisms; geometric constructions [plumb bob] Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint and specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) APPLY WATERPROOFING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Brush Proper materials Ladder Rollers Caulking Saw horse	Select proper materials Apply materials	Wear hard hat, safety glasses, safety shoes, and stabilize the ladder Hazard Flying and falling objects Falling
DECISIONS Determine what material to use, method of application and type of foundation	**CUES** Blueprints and construction	**ERRORS** Wet basement

(TASK STATEMENT) APPLY WATERPROOFING

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [rollers] Differences in absorption and radiation of energy between dark rough surfaces and light, smooth, polished surfaces [porous or non-porous walls]	Rational - positive fractions Use of numbers (without calculation) [ordering-measuring] Basic arithmetic skills and concepts [see appendix] Use of computing devices and mechanical aids [slide rule-concrete] Basic measurement skills and concepts: measure sense/role of unit; instruments [ruler]; rate [feet, sq. ft., cubic yards]; measurement: non-geometric [time, money, temperature, weight]; conversion from one standard unit to another Use of variables in formulae [volume]; manipulation of formulae [L.W.T.]; substitute given values in order to find the value of the required unknown Determination of area & volume of rectangular, cube and right triangular prisms; geometric constructions Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint and specifications Information report	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols, detail/inference

(TASK STATEMENT) CONSTRUCT SLAB ON GROUND CONSTRUCTION

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Hand tools Surveying equipment Proper materials Fastening devices Saw horse	Read blueprint Select and install proper materials Dismantle forms	Wear hard hat, safety glasses and safety shoes Hazard Flying and falling objects
DECISIONS Determine proper location, proper materials, proper method of dismantling of forms	**CUES** Blueprint and specifications Type of form	**ERRORS** Improper layout Not meeting standard specifications Broken form

(TASK STATEMENT) - CONSTRUCT SLAB ON GROUND CONSTRUCTION

SCIENCE	MATH -- NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational - positive fractions Use of numbers (without calculation) [ordering-measuring] Basic arithmetic skills and concepts [see appendix] Use of computing devices and mechanical aids [slide rule-concrete] Basic measurement skills and concepts: measure sense/role of unit; instruments [ruler]; rate [feet, sq. ft., cubic yards]; measurement: non-geometric [time, money, temperature, weight]; conversion from one standard unit to another Use of variables in formulae [volume] manipulation of formulae [L.W.T.]; substitute given values in order to find the value of the required unknown Determination of area & volume of rectangular, cube and right triangular prisms; geometric constructions Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Viewing	Code Blueprint and specifications Blueprint	Terminology Detail/inference Recognition of symbols, detail/inference

(TASK STATEMENT) CONSTRUCT ENTRANCE PLATFORMS AND STEPS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Hand tools Surveying equipment Proper materials Fastening devices Saw horse	Read blueprint Select and install proper materials Dismantle forms	Wear hard hat, safety glasses, safety shoes Hazard Flying and falling objects
DECISIONS	**CUES**	**ERRORS**
Determine proper size and location, type of material being used, correct method of dismantling form	Blueprint, specifications, type of form	Wrong size and location Not according to contract Broken forms

(TASK STATEMENT) CONSTRUCT ENTRANCE PLATFORMS AND STEPS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational - positive fractions Use of numbers (without calculation) [ordering-measuring] Basic arithmetic skills and concepts [see appendix] Use of computing devices and mechanical aids [slide rule-concrete] Basic measurement skills and concepts: measure sense/role of unit; instruments [ruler]; rate [feet, sq. ft., cubic yards]; measurement: non-geometric [time, money, temperature, weight]; conversion from one standard unit to another Use of variables in formulae [volume]; manipulation of formulae [L.W.T.]; substitute given values in order to find the value of the required unknown Determination of area & volume of rectangular, cube and right triangular prisms; geometric constructions Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint and specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

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(TASK STATEMENT) LAYOUT AND INSTALL SIDEWALKS AND DRIVES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Hand tools Surveying equipment Proper material Fastening devices Saw horse	Read blueprint Select and erect proper material Dismantle forms	Wear hard hat, safety glasses, safety shoes Hazard Flying and falling objects

DECISIONS	CUES	ERRORS
Determine proper size and location Determine type of material being used Determine correct method of dismantling	Blueprint Specifications Type of form	Wrong size and location Not according to contract Broken forms

(TASK STATEMENT) LAYOUT AND INSTALL SIDEWALKS AND DRIVES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [sledge] Effect of heating and cooling on expansion of materials (change of dimensions) [transit] Effect of heating and cooling on state of matter (change of matter from one form to another) [expansion and contraction of leveling bubbles in transit] Magnetic fields of force [effect compass on transit]	Rational - positive fractions Use of numbers (without calculation) [ordering-measuring] Basic arithmetic skills and concepts [see appendix] Use of computing devices and mechanical aids [slide rule-concrete] Basic measurement skills and concepts: measure sense/role of unit; instruments [ruler]; rate [feet, sq. ft., cubic yards]; measurement: non-geometric [time, money, temperature, weight]; conversion from one standard unit to another Use of variables in formulae [volume]; manipulation of of formulae [L.W.T.]; substitute given values in order to find the value of the required unknown Determination of area & volume of rectangular, cube and right triangular prisms; geometric constructions Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint and specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

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Duty C Floor Framing

1 Cut and install sills, termite shield, sill sealer
2 Layout, cut and erect girders, beams and columns
3 Layout, cut and install floor joists
4 Layout and install bridging
5 Install special framing
6 Install sub-flooring

(TASK STATEMENT) CUT AND INSTALL SILLS , TERMITE SHIELD, SILL SEALER

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Proper material Fastening devices Saw horse	Read blueprint Select proper materials Cut & install termite shield Cut and install sill sealer Cut sills to specifications Select anchons and install Set sills according to print Level sills and fasten Straighten sills	Wear hard hat, safety glasses, safety shoes Hazard Flying and falling objects

DECISIONS	CUES	ERRORS
Determine proper layout Determine correct size and type of material Determine proper alignments	Blueprint Specifications Sills not straight or square or properly aligned	Wrong dimension of building Improper bearing for floor joints Box sill not straight (header joists)

(TASK STATEMENT) CUT AND INSTALL SILLS, TERMITE SHIELD, SILL SEALER

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measurement Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; measurement: geometric (linear) Knowledge of geometric relationships; parallel [determine perimeter] Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

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(TASK STATEMENT) LAYOUT, CUT AND ERECT GIRDERS, BEAMS AND COLUMNS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Standard power tool kit Proper material Fastening devices Ladders Saw horse	Read blueprint and specifications Select proper materials Select proper fastening devices Select proper columns Select type of beam	Wear hard hat, safety glasses, safety shoes Stabilize ladder Hazard - falls, flying or falling objects
DECISIONS	**CUES**	**ERRORS**
Determine proper type of material Determine proper fastening devices Determine proper type of columns Determine proper type of beam	Blueprint and specifications	Improper strength of beam Buckling of beam Collapse of column

(TASK STATEMENT) LAYOUT, CUT AND ERECT GIRDERS, BEAMS AND COLUMNS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measurement Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; measurement: geometric (linear) Knowledge of geometric relationships; parallel [determine perimeter] Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications	Detail/inference
	Blueprint	Recognition of symbols
		Detail/inference

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(TASK STATEMENT) LAYOUT AND CUT AND INSTALL FLOOR JOISTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Proper material Proper fastening devices Saw horse	Read blueprint and specifications Select proper material Select proper fastening devices Layout Cut and install	Wear hard hat, safety shoes, safety glasses Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper size & type of material Determine proper fastening devices Determine proper layout Determine if floor joist should be cut Determine crown	Blueprint and specifications Floor joists not falling 16'' on center Improper lap Twisted floor joist Bearing or non-bearing walls	Wear & sagging floors Floor joists not anchored properly Sub-flooring will not fit properly Excessive crown

(TASK STATEMENT) LAYOUT AND CUT AND INSTALL FLOOR JOISTS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measurement Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; measurement: geometric (linear) Knowledge of geometric relationships; parallel [determine perimeter] Basic logic: deductive or inductive

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COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) LAYOUT AND INSTALL BRIDGING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Proper materials Fastening devices	Read blueprint and specifications Select proper materials Select proper fastening devices Select proper location Cut Install	Wear safety glasses, safety shoes, hard hat Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper location Determine proper materials Determine proper fastening devices Determine proper fit and installation Determine if solid bridging is required	Blueprint of specification Specifications Type of floor joists Location of top and bottom of bridging on floor joists	Inadequate bracing Not according to specifications Not secured properly Either too long and hang below joists Too short, does not fit adequate bracing

(TASK STATEMENT) LAYOUT AND INSTALL BRIDGING

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measurement Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; measurement: geometric [linear] Knowledge of geometric relationships; parallel [determine perimeter] Basic logic: deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications	Detail/inference
	Blueprint	Recognition of symbols
		Detail/inference

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(TASK STATEMENT) INSTALL SPECIAL FRAMING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Ladders Proper materials Special hangers Fastening devices	Read blueprint & specifications Select proper materials Select special hangers Select fastening devices Cut and install special framing	Wear safety shoes, hard hat, safety glasses. Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine special framing & layout	Blueprint	Not build according to plan
Determine proper materials	Specifications	Inadequate support
Determine type of special hangers	Specifications	Inadequate holding power
Determine type of fastening device		
Determine where to cut & type of installation	Specifications	Improper installation

(TASK STATEMENT) INSTALL SPECIAL FRAMING

SCIENCE	MATH - NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measurement Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; measurement: geometric [linear] Knowledge of geometric relationship; parallel [determine perimeter] Basic logic: deductive or inductive

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COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) INSTALL SUB-FLOORING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper material Fastening devices Adhesive Adhesive gun	Read blueprint and specifications Select proper material Select proper fastening devices Select adhesives	Wear safety glasses, safety shoes, hard hat Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper material Determine proper fastening devices Determine proper adhesive Determine when to cut and install Determine amount of spacing required for expansion of material	Specification Specification Improper fitting	Weak floor Squeaky floor Waste material and improper measurement

ASK STATEMENT) INSTALL SUB-FLOORING

SCIENCE	MATH NUMBER SYSTEMS
Simple machines used to gain mechanical advantage[hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measurement Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; measurement: geometric [linear Knowledge of geometric relationship; parallel [determine perimeter] Basic logic: deductive or inductive

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COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications Blueprint	Detail/inference Recognition of symbols Detail/inference

Duty D Wall and Ceiling Framing

1 Layout plates and rough openings on exterior walls
2 Cut and assemble corner posts
3 Cut and fabricate headers and rough sills
4 Assemble and erect exterior wall sections
5 Layout, assemble and erect interior partitions
6 Install double plates
7 Install backing for fixtures
8 Layout, cut and install ceiling joists
9 Install nailers

(TASK STATEMENT) LAYOUT PLATES AND ROUGH OPENINGS, EXTERIOR WALLS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper material	Read blue print specifications Select proper material Cut and layout	Wear hard hat, safety glasses, safety shoes Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper material Determine when and where to cut Determine proper layout	Blueprint and specifications Layout of studs on plates Blueprint and specifications	Not according to blueprint & specifications, waste material, weak wall Waste material Wrong location of opening, wrong location of studs - not 16'' O.C.

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TASK STATEMENT) LAYOUT PLATES AND ROUGH OPENINGS, EXTERIOR WALLS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans, blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology, detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) CUT AND ASSEMBLE CORNER POSTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Fastening devices Proper materials Saw horse	Read blueprint and specifications Select proper material Select fastening devices Cut and fabricate	Wear hard hat, safety shoes, safety glasses Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper material Determine proper fastening devices Determine when to cut & fabricate Determine type of corner post to build	Blueprint and specifications Specifications Improper fabrications	Not according to blueprint & specifications Weak corner post Waste material

ASK STATEMENT) CUT AND ASSEMBLE CORNER POSTS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

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COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications Blueprint	Detail/inference Recognition of symbols Detail/inference

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(TASK STATEMENT) CUT AND FABRICATE HEADERS AND ROUGH SILL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper materials Fastening devices	Read blueprint and specfications Select proper materials Select fastening devices Cut and fabricate	Wear safety glasses, safety shoes, hard hats Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper material	Blueprint and specifications	Weak headers and not according to blueprint and specifications
Determine proper fastening devices	Blueprint and specifications	Waste material
Determine size and methods of fabrications	Blueprint and specifications	Rough opening now in proper location
Determine if rough opening is layed out correctly		

ASK STATEMENT) CUT AND FABRICATE HEADERS AND ROUGH SILL

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Viewing	Code Blueprint specifications Blueprint	Terminology Detail/inference Recognition of symbols Detail/inference

(TASK STATEMENT) ASSEMBLE AND ERECT EXTERIOR WALL SECTIONS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Fastening devices Ladders Bracing material Corner post Studs Plates Sheathing Headers	Read blueprint and specifications Select proper sequence of assembly	Wear safety shoes, hard hat, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine the proper sequence of assembling Determine if rough openings and studs are layed out correctly	Blueprint	Wrong placement of studs, waste material Improper location of rough openings

ASK STATEMENT) ASSEMBLE AND ERECT EXTERIOR WALL SECTIONS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Viewing	Code Blueprint specifications Blueprint	Terminology Detail/inference Recognition of symbols Detail/inference

(TASK STATEMENT) LAYOUT ASSEMBLE AND ERECT INTERIOR PARTITIONS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper materials Fastening devices	Read blueprint and specifications Layout and assemble proper material Select proper fastening devices Erect interior partitions	Wear hard hats, safety glasses, safety shoes Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper material, layout and method of assembly Determine correct method of fastening Determine proper placement of interior partitions	Blueprint and specifications Splitting of material Blueprint and specifications	Waste material, inadequate support Waste material - weaken material Not according to blueprint and specifications

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ASK STATEMENT) LAYOUT, ASSEMBLE AND ERECT INTERIOR PARTITIONS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) INSTALL DOUBLE PLATES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Ladder Proper materials Fastening devices	Read blueprint and specifications Select proper material Select proper fastening devices Select type and location of double plate Brace double plates	Wear safety shoes, hard hat, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper material Determine proper fastening devices Determine type and location of double plates Determine when and where to brace	Blueprint and specifications Specifications Blueprint and specifications	Weak wall, improper tie-in of interior partitions Should be lath catcher, waste material Walls not plumb

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(TASK STATEMENT) INSTALL DOUBLE PLATES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading Viewing	Code Blueprint specifications Blueprint	Terminology Detail/inference Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL BACKING FOR FIXTURES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper materials Fastening devices Ladder	Read blueprint and specifications Select proper material Select proper fastening devices Select location, install backing	Wear hard hat, safety shoes, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine location	Blueprint and type of fixture	Not according to blueprint, wrong dimension
Determine proper material Determine fastening devices	Blueprint and type of fixture Type of material	Inadequate support Could splinter material, waste material
Determine if installed properly	Location of backing in regards to placement in wall area Springs when fixture fastened to backing	Distorted wall area Improper fastening

ASK STATEMENT) INSTALL BACKING FOR FIXTURES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications	Detail/inference
	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) LAYOUT, CUT AND INSTALL CEILING JOISTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper materials Fastening devices Ladder Scaffolding	Read blueprint and specifications Select proper layout Select proper material Select proper fastening devices Layout and cut ceiling joists Select proper installation	Wear hard hat, safety shoes, safety glasses Stabilize ladder, scaffolding Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper layout	Blueprint	Rock lath & plasterboard not on centers of joists
Determine proper material	Blueprint and span	Sagging ceiling, does not meet specifications
Determine proper fastening devices	Material	Split joists, waste material
Determine when to cut ceiling joists	Blueprint and rough openings	Improper location of rough openings
Determine proper location as to centers location on plates	Location on layout on plates	Rock lath & plasterboard not on centers of joists
Determine if spacer board is needed in center of ceiling joists		

ASK STATEMENT) LAYOUT, CUT AND INSTALL CEILING JOISTS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational – positive Use of numbers (without calculation) – counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL NAILERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Power standard tool kit Saw horse Ladder Proper materials Fastening devices	Select area where backing or nailers should be installed Select proper materials Select proper fastening devices Install nailers	Wear safety shoes, safety glasses, hard hats Follow guidelines in Occupational Safety & Health Act Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine location of nailers Determine proper materials Determine proper fastening devices Determine proper method of installation	In wall and ceiling covering can be nailed properly Type of material to be fastened to nailer and location Type of nailer If nailer is springy	Loose corners, ceiling sags Backing does not give adequate support Nailer becomes loose when fastening on wall or ceiling covering Difficult to secure wall and ceiling covering adequately

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ASK STATEMENT) INSTALL NAILERS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of material] Motion resulting from two or more forces acting on a point in a body [expansion and con traction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational – positive Use of numbers (without calculation) – counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, manipulation of formulae [board feet] Basic logic – deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications Blueprint	Detail/inference Recognition of symbols Detail/inference

Duty E Roof Framing

1 Layout rafters on top plate and ridge board
2 Layout, cut and install common rafters
3 Layout, cut and install hip, valley and jack rafters
4 Layout, cut and install gable end stoppings
5 Install felt paper and roof sheathing
6 Layout and install trusses

(TASK STATEMENT) LAYOUT RAFTER ON TOP PLATE AND RIDGE BOARD

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper materials Ladder Scaffolding	Read blueprint and specifications Select proper materials Layout rafter Cut	Wear hard hat, safety glasses, safety shoes Stabilize ladder and scaffolding Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper materials Determine if rafters layed out properly Determine where to cut and join ridge board	Blueprint Ridge must correspond with layout of top plate Where ridge board is located in reference to rafter	Sagging roof, weak roof Improper alignment of rafters Will not align properly with ceiling joists Waste material

(TASK STATEMENT) LAYOUT RAFTER ON TOP PLATE AND RIDGE BOARD

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, in functions, Pythagorean - figuring rise and run for the pitch of a roof; solve problems involving literal algebraic expressions Knowledge of geometric relationships - congruence [same slope], similarity [same shape], parallel, perpendicular Understanding and use of the Pythagorean theorem, based on the right triangle; determination of area and altitude of triangles; determination of area and circumference of circles; geometric constructions [plumb rafter] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) LAYOUT, CUT AND INSTALL COMMON RAFTERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper materials Fastening devices	Read blueprint and specifications Select proper materials Layout rafters Cut rafters Select proper fastening devices Install rafters	Wear safety shoes, hard hat, safety glasses Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper materials Determine layout Cut according to layout Determine proper fastening devices Install according to layout on top plate and ridge board	Blueprint and specifications Pitch of roof Layout of rafter Type and size of material Alignment and spacing	Weak and sagging roof Improper alignment Waste material Split rafters Roof deck will not meet on rafters

ASK STATEMENT) LAYOUT, CUT AND INSTALL COMMON RAFTERS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, in functions, Pythagorean - figuring rise and run for the pitch of a roof; solve problems involving literal algebraic expressions Knowledge of geometric relationships - congruence [same slope], similarity [same shape], parallel, perpendicular Understanding and use of the Pythagorean theorem, based on the right triangle; determination of area and altitude of triangles; determination of area and circumference of circles; geometric constructions [plumb rafter] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications Blueprint	Detail/inference Recognition of symbols Detail/inference

(TASK STATEMENT) LAYOUT, CUT AND INSTALL HIP, VALLEY AND JACK RAFTERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Proper materials Fastening devices Ladder Scaffolding	Read blueprint and specifications Select proper materials Layout - hip & valley rafters Cut to layout Install according to rafter layout Layout jack rafters Cut jack rafters according to layout Layout jack rafters on hip and valley rafters Install	Wear safety shoes, safety glasses, hard hat Stabilize ladder & scaffolding Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper materials Determine proper layout of hip & valley rafters Cut according to layout Install according to layout Layout jack rafters Cut according to layout Determine layout on hip & valley rafter and plate on ridge Install on layout on hip & valley rafter and plate and ridge	Blueprints and specifications	Weak roof Poor fits Waste material Roof sheathing does not fit properly Different pitches

(TASK STATEMENT) LAYOUT, CUT AND INSTALL HIP, VALLEY AND JACK RAFTERS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, in functions, Pythagorean - figuring rise and run for the pitch of a roof; solve problems involving literal algebraic expressions Knowledge of geometric relationships - congruence [same slope], similarity [same shape], parallel, perpendicular Understanding and use of the Pythagorean theorem, based on the right triangle; determination of area and altitude of triangles; determination of area and circumference of circles; geometric constructions [plumb rafter] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) LAYOUT, CUT AND INSTALL GABLE END STUDDINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horses Proper materials Fastening devices Ladder Scaffolding	Read blueprint and specifications Select proper materials Layout gable end studdings Cut and install gable find studdings	Wear safety glasses, safety shoes, hard hat Stabilize ladder and scaffolding Hazard: Flying or falling objects Falls

DECISIONS	CUES	ERRORS
Determine proper materials Determine proper layout Determine proper fastening devices Determine how to cut and proper method of fastening Determine if rough opening needed for louvre	Specifications and blueprint Studs not layed out properly	Not according to plans and specifications Sheathing will not fit properly Waste materials

ASK STATEMENT) LAYOUT, CUT AND INSTALL GA[illegible]E STUDDINGS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [materials warps or twist]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, in functions, Pythagorean - figuring rise and run for the pitch of a roof; solve problems involving literal algebraic expressions Knowledge of geometric relationships - congruence [same slope], similarity [same shape], parallel, perpendicular Understanding and use of the Pythagorean theorem, based on the right triangle; determination of area and altitude of triangles; determination of area and circumference of circles; geometric constructions [plumb rafter] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL FELT PAPER AND ROOF SHEATHING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Saw horse Ladder Scaffolding Proper materials Fastening devices Staple gun Felt paper	Read blueprint and specifications Select proper materials Select proper fastening devices Cut and install Select proper felt paper Select proper method of installation	Stabilize ladder and scaffolding Hazard - falls

DECISIONS	CUES	ERRORS
Determine proper materials	Specifications	Not according to plans and specifications
Determine proper fastening devices		Weak and leaking roof
Determine how to cut and proper method of installation	Type of roof	Materials too short, waste material
Determine proper weight of felt paper to be installed	Specifications	Buckle shingles
Determine proper method of installation	Over-lap	Roof leak

ASK STATEMENT) INSTALL FELT PAPER AND ROOF SHEATHING

SCIENCE

Simple machines used to gain mechanical advantage [hammer]
Effect of heating and cooling on expansion of materials [expansion and contraction of materials]
Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material]
Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials]
Resistance of materials to change in shape [material warps or twists]

MATH – NUMBER SYSTEMS

Rational - positive
Use of numbers (without calculation) - counting, measuring
Basic arithmetic skills and concepts (see appendix)
Measure sense/role of unit; linear measurement; read and interpret scale drawings/floor plans/blueprints
Use of variables in formulae, in functions, Pythagorean - figuring rise and run for the pitch of a roof; solve problems involving literal algebraic expressions
Knowledge of geometric relationships - congruence [same slope], similarity [same shape], parallel, perpendicular
Understanding and use of the Pythagorean theorem, based on the right triangle; determination of area and altitude of triangles; determination of area and circumference of circles; geometric constructions [plumb rafter]
Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) LAYOUT AND INSTALL TRUSSES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Power standard tool kit Scaffolding Ladder Fastening devices Bracing	Read blueprints and specifications Layout on double top plate Install Plumb and brace	Wear safety hat, safety shoes, hard hats Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine layout is proper Determine proper method of installation Determine if plumb and braced correctly	Alignment; how roof deck fits trusses Height of building Trusses perpendicular to outside walls and aligned from one side to other side	Roof deck will not fit, waste material Drop of break truss Swayed roof, gable ends not plumb

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ASK STATEMENT) LAYOUT AND INSTALL TRUSSES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae, in functions [Pythagorean - figuring rise and run for the pitch of a roof]; solve problems involving literal algebraic expressions Knowledge of geometric relationships - congruence [same slope], similarity [same shape], parallel, perpendicular Understanding and use of the Pythagorean theorem, based on the right triangle; determination of area and altitude of triangles; determination of area and circumference of circles; geometric constructions [plumb rafter] Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications Information report	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

Duty F Roofing

1 Install drip edge and flashing
2 Install roof caps, louvres and vents
3 Layout and install asphalt shingles

(TASK STATEMENT) INSTALL DRIP EDGE AND FLASHING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Scaffolding Fastening devices Proper materials	Read blueprint and specifications Select proper material Select proper fastening devices Cut and install	Wear safety shoes, safety glasses, hard hats Stabilize scaffolding Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper material Determine proper fastening devices Determine if installation is proper	Specifications and blueprint	Flashing bent Leaking roof Raise shingles

(TASK STATEMENT) INSTALL DRIP EDGE AND FLASHING

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rationals - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments (choose appropriate ones); linear measurement; read and interpret scale drawings/floor plans/blueprints Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL ROOF CAPS AND LOUVRES AND VENTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Proper material Fastening devices Ladder	Read blueprint specifications Select proper materials Select fastening devices Select proper location Select method of installation	Wear safety shoes, safety glasses, hard hats Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper material Determine proper fastening devices Determine proper location Determine proper method of installation	Blueprint and specifications Correct spacing Loose caps or louvres	Roof caps blow off in a strong wind Leaky roof

ASK STATEMENT) INSTALL ROOF CAPS AND LOUVRES AND VENTS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials (change of dimensions) [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational numbers–positives Use of numbers (without calculation) – counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; linear, area, and rate measurement; read and interpret tables, charts and graphs (scale drawings/floor plans/blueprints) Use of variables in formulae, in functions [Pythagorean – figuring rise and run for the pitch of a roof]; solve problems involving literal algebraic expressions; manipulation of formulae; substitute given values to find the value of the required unknown Knowledge of geometric relationships – congruence [same slope], similarity [same shape], parallel, perpendicular Understanding and using the Pythagorean theorem, based on the right triangle; determination of area and altitude of triangles; determination of area and circumference of circles; geometric constructions [plumb rafter, finding centers of vents]; determination of area, perimeter and diagonals of polygons with more than four sides; use of arcs or chords in determining facts about a circle or its parts; determination of area and perimeter of an ellipse Basic logic – deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) LAYOUT AND INSTALL ASPHALT SHINGLES

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Standard tool kit Proper materials Fastening devices Ladder Scaffolding Ladder jacks Roof jacks	Read blueprints and specifications Select proper materials Select fastening devices Select proper scaffolding Select method of installation	Wear non-skid shoes, hard hat, safety glasses Stabilize ladder and scaffolding Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper materials Determine proper fastening devices Determine proper method of installation Determine when to use scaffolding or ladder jacks Determine when to use roof jacks	Blueprint and specifications Type of material Type of construction Type and pitch of roof Lap of shingles - vertical and horizontal	Leaky roof Shingles not aligned properly

(TASK STATEMENT) LAYOUT AND INSTALL ASPHALT SHINGLES

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rationals – positive Use of numbers (without calculation) – counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments (choose appropriate ones); linear measurement; read and interpret scale drawings/floor plans/blueprints Basic logic – deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

Duty G Exterior Finish

1 Install exterior windows, door frames, and hardware
2 Install fascia and soffit, frieze board and moldings
3 Apply exterior wall finish
4 Cut and install gutters and downspouts

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(TASK STATEMENT) INSTALL EXTERIOR WINDOWS, DOOR FRAMES, AND HARDWARE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Standard tool kit Power standard tool kit Proper materials Fastening devices Saw horse Ladders Shims	Read blueprint and specifications Select proper materials Select proper fastening devices Select proper location of material Select material to be shimmed Method of installation Select method of installing special units Select and locate hardware to be installed Select method of installation	Wear hard hat, safety shoes, safety glasses Stabilize ladders Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper materials	Blueprint and specifications	Door or window not plumb
Determine proper fastening devices	Alignment of window	Not located properly
Determine if proper material is in the right location for installation	Door swings in wrong direction	Hard to operate
Determine when & where shims should be installed	Doors & windows sticking or dragging	Door swings in wrong direction
Determine proper method of installation	Bay window - special	Leaky units
Determine method of installing special windows	Door units - sliding doors	Latch binds
Determine if hardware is correct	Hardware does not operate properly	Knob hard to operate
Determine proper method of installation	Doors will not latch properly	Strike plate not located properly

ASK STATEMENT) INSTALL EXTERIOR WINDOWS, DOOR FRAMES AND HARDWARE

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Recognize and identify basic geometry figures, plane and solid; knowledge of geometric relationships - similarity, parallel and perpendicular; geometric constructions Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications	Detail/inference
	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) INSTALL FASCIA AND SOFFIT, FRIEZE BOARD AND MOLDINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Proper materials Fastening devices Ladder Scaffolding Saw horse Blocking	Read blueprint specifications Select proper materials Select fastening devices Select and install proper scaffolding Locate blocking Select method of installing fascia Select method of installing soffit Select method of installing frieze board Select method of installing molding	Wear hard hat, safety shoes, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine if materials proper Determine of fastening devices selected are proper Determine type of scaffolding needed Determine where blocking is needed and method of installtion Determine method of installing fascia, soffit, frieze board and molding	Blueprint and specifications Bowed material Where joints meet	Fascia board not plumb, straight and joints open Joints open where soffit material meet Miter joints do not fit properly when installing molding

(TASK STATEMENT) INSTALL FASCIA AND SOFFIT, FRIEZE BOARD AND MOLDINGS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Recognize and identify basic geometry figures, plane and solid; knowledge of geometric relationships - similarity, parallel and perpendicular; geometric constructions Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) APPLY EXTERIOR WALL FINISH

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY - HAZARD
Standard tool kit Power standard tool kit Saw horse Ladders Scaffolding Fastening devices Caulking and gun Aluminum foil insulation Felt paper	Read blueprint and specifications Select proper materials Select fastening devices Select aluminum foil insulation Select method of installation Select caulking to be used Cut and install wall finish	Wear safety glasses, hard hats, safety shoes Stabilize ladder and scaffolding Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine if material is correct Determine if foil insulation or felt paper is to be used Determine proper fastening devices Determine method of installation Determine where and when to use caulking	Blueprint and specifications Type of material used Exposed surface varies Gaps in joints	Wrong material installed according to specifications Leaking wall finish Starter strip not level Improper cutting

(TASK STATEMENT) APPLY EXTERIOR WALL FINISH

SCIENCE	MATH -- NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Recognize and identify basic geometry figures, plane and solid; knowledge of geometric relationships - similarity, parallel and perpendicular; geometric constructions Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) CUT AND INSTALL GUTTERS AND DOWNSPOUTS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY -- HAZARD
Standard tool kit Power standard tool kit Ladders Ladder jacks Saw horse Fastening devices Proper materials Caulking and gun	Read blueprint and specifications Select proper materials Select fastening devices Select method of installation Cut and install	Wear hard hat, safety shoes, safety glasses Stabilize ladders Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine if material is correct Determine if fastening devices are adequate and correct Determine if method of installation is correct Determine proper method of cutting and fastening of joints	Blueprint and specifications Water does not flow properly Joints open	Install improperly Water leakage Caulking not installed

(TASK STATEMENT) CUT AND INSTALL GUTTERS AND DOWNSPOUTS

SCIENCE	MATH -- NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Recognize and identify basic geometry figures, plane and solid; knowledge of geometric relationships - similarity, parallel and perpendicular; geometric constructions Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

Duty H Insulation

1 Install insulation and vapor barrier

(TASK STATEMENT) INSTALL INSULATION AND VAPOR BARRIERS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kits Ladder Proper materials Fastening devices	Read blueprint and specifications Select proper materials Select proper fastening devices Select correct method of installing insulation Select proper materials for vapor barrier Install material for vapor barrier	Wear safety shoes, hard hat, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper type of material needed for insulation Determine amount of insulation needed Determine type of material needed for a vapor barrier	Specifications and blueprint House too cold in winter	Not enough insulation in walls or ceiling

(TASK STATEMENT) INSTALL INSULATION AND VAPOR BARRIERS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Fundamental operations (calculation) - addition, subtraction, multiplication, division algorithm and order of operations, i.e. use of parentheses in simplifying arithmetic expressions

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Recognition of symbols
		Detail/inference

Duty I Interior Trim

1 Apply gypsum wall board
2 Install paneling
3 Install suspended ceilings
4 Install finish flooring, underlayment and floor tile
5 Install doors
6 Install interior trim
7 Install interior hardware
8 Install cabinets

(TASK STATEMENT) APPLY GYPSUM WALL BOARD

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Ladders Proper materials Fastening devices Saw horse Adhesive Caulking gun	Read blueprint and specifications Select proper material Select fastening devices Select method of installation Cut and install wall board	Wear hard hat, safety shoes, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine correct material to be used Determine method of attaching wall board Determine correct method to cut and install wallboard	Blueprint and specifications Wasted material Where joints meet Holes for outlets cut in improper places Nails keep popping out	Improper measurements Nails too short for thickness of dry wall Nail to outside of stud

(TASK STATEMENT) APPLY GYPSUM WALL BOARD

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL PANELING

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Ladder Saw horse Proper materials Fastening devices Caulking gun	Read blueprint and specifications Sele ~ proper material Select fastening devices Select method of installation Cut and install	Wear hard hat, safety shoes, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine correct material for the job Determine if the fastening device is adequate and correct Determine if method of installation is correct Determine proper method of cutting and fastening panels	Blueprint and specifications Gaps in joints Panels do not fall on center of steps Panels patterns not in sequence	First panel not plumb before nailing Studs not spaced correctly

(TASK STATEMENT) INSTALL PANELING

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL SUSPENDED CEILINGS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Ladder Saw horse Proper materials Fastening devices Water level Portable scaffolding	Read blueprint and specifications Select proper materials Select fastening devices Select correct method of installing furring strips Select correct method of installation	Wear hard hat, safety shoes, safety glasses Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper materials Determine if fastening devices are adequate and correct Determine lowest point in room Determine proper method of installing Determine proper method of cutting and installing	Blueprint and specifications Pads hit on center of furring strips Wavy ceiling	Pattern layout incorrect Furring strip not level

(TASK STATEMENT) INSTALL SUSPENDED CEILINGS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists	Rational - positive Use of numbers (without calculation) - counting, ordering measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
	Information report	Detail/inference, terminology
Viewing	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) INSTALL FINISH FLOORING, UNDERLAYMENT AND FLOOR TILE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Proper materials Saw horse Fastening devices	Read blueprint and specifications Selecting proper material Selecting fastening devices Select material for underlayment Selecting method of installing underlayment Selecting material and method for installing flooring	Wear hard hat, safety shoes, safety glasses Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper material Determine fastening devices Determine method of proper installation Determine proper type of underlayment Determine proper method of installing underlayment	Blueprint and specifications Buckled floor Squeaky floors Open joints	Underlayment not applied properly Improper installation not secured adequately

(TASK STATEMENT) INSTALL FINISH FLOORING, UNDERLAYMENT AND FLOOR TILE

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
	Blueprint specifications	Detail/inference
Viewing	Blueprint	Detail/inference
		Recognition of symbols

(TASK STATEMENT) INSTALL DOORS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Door jack Saw horse Hinges	Read blueprint and specifications Select proper materials Select hinges Select door for size Select method of installation	Wear hard hat, safety shoes, safety glasses Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine if proper material meets specifications	Blueprint and specifications	Hinges set too deep
Determine number of hinges and size needed for doors	Hinges bound	Hinges on a bind or need oil
Determine if door is the right size	Squeaky hinge	
Determine methods of installation	Binding door	Not fit properly to jamb
Determine if door is properly installed	Spacing around side of door not equal	
	Rubs carpet on floor	Door too long for opening
	Top or bottom of door on lock side protrudes beyond jamb	Twisted door or hinges not set correctly, and hinges may be sprung
	Door does not latch properly	Stops not set right
		Strike plate not installed correctly

ASK STATEMENT) INSTALL DOORS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code, information report Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recc ion of symbols Det: nference

(TASK STATEMENT) INSTALL INTERIOR TRIM

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Proper materials Fastening devices Saw horse	Blueprint and specifications Select proper materials Select fastening devices Select proper method of installation Select proper location and type of trim to be installed	Wear hard hat, ety shoes, safety glasses Hazard - flying falling objects

DECISIONS	CUES	ERRORS
Determine proper material Determine fastening devices Determine proper method of installation	Blueprint and specifications Open joints Margin too wide or too narrow Trim does not meet floor or stool Split where secured	Cut improperly Improperly installed Cut too short, waste material Holes not pre-drilled

ASK STATEMENT) INSTALL INTERIOR TRIM

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL INTERIOR HARDWARE

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Special jigs Special bits Proper materials Fastening devices	Read blueprint and specifications Select proper material Select fastening devices Select method of installation	Wear hard hat, Safety shoes, Safety glasses Proper use of hand tools Hazard Injury to body

DECISIONS	CUES	ERRORS
Determine if material meets specifications Determine proper fastening devices Determine proper method of installation of hardware	Blueprint and specifications Binding lockset Does not latch correctly	Lockset not installed properly Strike plate not aligned with latch

ASK STATEMENT) INSTALL INTERIOR HARDWARE

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code, information report Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) INSTALL CABINETS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Ladders Proper material Fastening devices Saw horse	Read blueprint and specifications Select proper material Select fastening devices Select method of installation Select moldings Select method of installing molding	Wear safety glasses, safety shoes, hard hats Stabilize ladders Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper location of cabinets Determine proper method of securing cabinets and installation Determine if moldings are needed Determine method of installing moldings	Blueprints and specifications Cabinets not level on plumb Doors do not work properly Drawers do not operate properly	Improper material installed Improper installation Improper installation of door hardware Improper fitting of doors, improper installation of drawer hardware

ASK STATEMENT) INSTALL CABINETS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; rate [cost per sq. ft.]; linear and area measurement [geometric]; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae [sq. ft.]; manipulation of formulae [area equals L x W]; substitute given values in order to find the value of the required unknown Basic logic - inductive or deductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

Duty J Stairs

1 Layout stair stringers or horses, cut and install
2 Layout, cut and install stair risers and treads
3 Layout, cut and install newells, ballisters, and hand rails

(TASK STATEMENT) LAYOUT STAIR STRINGERS OR HORSES, CUT AND INSTALL

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Ladder Proper materials Fastening devices	Read blueprint and specifications Select proper material Select proper fastening devices Select layout method Select method of cutting and installing	Wear safety glasses, safety shoes, hard hat Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine proper materials Determine proper fastening devices Determine if layout is correct Determine proper method of cutting and installing	Blueprint and specifications Stringers not secured properly away from wall Angles of stringers off Tread too wide or narrow Rise too high or low	Wrong material used Improper fastening Not layed out properly

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TASK STATEMENT: LAYOUT STAIR STRINGERS OR HORSES, CUT AND INSTALL

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of materials] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae; expression of product in terms of its prime factors, numerical or monomial [Pythagorean theorem; substitute given values in order to find the value of the required unknown]; solve problems involving literal algebraic expressions [Pythagorean theorem] Knowledge of geometric relationships; understanding and using the Pythagorean theorem, based on the right triangle; geometric constructions Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code	Terminology
Viewing	Blueprint specifications	Detail/inference
	Blueprint	Recognition of symbols
		Detail/inference

(TASK STATEMENT) LAYOUT, CUT AND INSTALL STAIR RISERS AND TREADS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Ladder Saw horse Proper materials Fastening devices Glue Wedge	Read blueprint and specifications Select proper material Select proper fastening devices Select method of cutting Select method of installation	Wear safety glasses, safety shoes, hard hat Stabilize ladder Hazard - flying or falling objects, falls

DECISIONS	CUES	ERRORS
Determine if material is proper Determine proper fastening devices Determine method of cutting Determine proper method of installation	Blueprint and specifications Loose treads Run too long or narrow Rist too high or low Squeaky treads	Wrong material installed Not installed properly Improper layout

ASK STATEMENT) LAYOUT, CUT AND INSTALL STAIR RISERS AND TREADS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae; expression of product in terms of its prime factors, numerical or monomial [Pythagorean theorem]; substitute given values in order to find the value of the required unknown; solve problems involving literal algebraic expressions [Pythagorean theorem] Knowledge of geometric relationships; understanding and using the Pythagorean theorem, based on the right triangle; geometric constructions Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

(TASK STATEMENT) LAYOUT, CUT AND INSTALL NEWELLS, BALLISTERS AND HAND RAILS

TOOLS, EQUIPMENT, MATERIALS, OBJECTS ACTED UPON	PERFORMANCE KNOWLEDGE	SAFETY – HAZARD
Standard tool kit Power standard tool kit Hardware Proper materials Fastening devices Saw horse Glue	Read blueprint and specifications Select proper material Select fastening devices Select method of layout Select method of cutting Select method of installation	Wear safety shoes, hard hats, safety glasses Hazard - flying or falling objects

DECISIONS	CUES	ERRORS
Determine proper materials Determine fastening devices Determine if layout is correct Determine proper sequence of cutting material Determine proper sequence of installation	Blueprint and specifications Handrail too low or too high Ballisters not plump Newell not plumb	Material does not meet specifications Improper layout, improper installation

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(ASK STATEMENT) LAYOUT, CUT AND INSTALL NEWELLS, BALLISTERS AND HAND RAILS

SCIENCE	MATH – NUMBER SYSTEMS
Simple machines used to gain mechanical advantage [hammer] Effect of heating and cooling on expansion of materials [expansion and contraction of materials] Motion resulting from two or more forces acting on a point in a body [expansion and contraction of material] Arrangement of molecules, atoms and ions and the effect on structure and strength of materials [tensile strength of materials]] Resistance of materials to change in shape [material warps or twists]	Rational - positive Use of numbers (without calculation) - counting, ordering, measuring Basic arithmetic skills and concepts (see appendix) Measure sense/role of unit; instruments [ruler]; linear measurement; read and interpret scale drawings/floor plans/blueprints Use of variables in formulae; expression of product in terms of its prime factors, numerical or monomial [Pythagorean theorem]; substitute given values in order to find the calue of the required unknown; solve problems involving literal algebraic expressions [Pythagorean theorem] Knowledge of geometric relationships; understanding and using the Pythagorean theorem, based on the right triangle; geometric constructions Basic logic - deductive or inductive

COMMUNICATIONS

PERFORMANCE MODES	EXAMPLES	SKILLS/CONCEPTS
Reading	Code Blueprint specifications	Terminology Detail/inference
Viewing	Blueprint	Recognition of symbols Detail/inference

APPENDIX A
Basic Arithmetic Skills and Concepts

Set of Real Numbers
- Irrationals/Rationals
  - Fractions/Decimals
    - Integers (. . . -3, -2, -1, 0, +1, +2, +3, . . .)
      - Whole Numbers (0, 1, 2, 3, . . .)
        - Counting Numbers (1, 2, 3, 4, . . .)

Fundamental Operations (Calculation)
- Addition algorithm
- Subtraction algorithm
- Multiplication algorithm
- Division algorithm
- Order of operations, i.e., use of parentheses in simplifying arithmetic expressions

Basic Skills
- Reduction of fractions
- Changing mixed numbers to improper fractions
- Changing percents to fractions and fractions to percents
- Finding a percent of a number and what percent one number is of another
- Changing fractions to decimals and decimals to fractions
- Ratio and proportion - estimation
- Rounding off decimals and whole numbers
- Approximation using scientific notation
- Guess and check method
- Rule of thumb
- Property of comparison
  - equality/equivalence
  - inequality/greater than/less than
- Properties of the real number system
  - commutative (order), associative (grouping), distributive (multiplication W.R.T. addition)
  - identity of one (x)
  - identity of zero (+)
  - multiplication by zero
  - transitive
  - inverses-multiplicative and additive

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APPENDIX B
Tools and Equipment

Standard Tool Kit consists of:

- Claw hammer
- Nail puller
- Chalk box
- Cross-cut saw
- Crayon
- Folding rule
- Tape, 10'
- Tape, 50'
- Tape, 100'
- Pinch bar
- Speed bore bits
- File card
- Screwdriver, 4''
- Screwdriver, 6''
- Plumb bob
- Dry line
- T-bevel
- Scratch awl
- Try square
- Framing square
- Combination square
- Utility knife
- Line level
- Level, 28''
- Wing dividers
- Files
- Red pencil
- Carpenter's pencil
- Twist drill bits
- Chisels
- Bee's wax
- Crescent wrench
- Block plane
- Needle nose pliers
- Common pliers
- Coping saw
- Drywall saw
- Butt gauge
- Pop rivet gun
- Spackling knife
- Straight snips
- Aviation snips

Power Standard Tool Kit consists of:

- Portable circular saw
- Reciprocating saw
- Portable electric drill
- Portable router and cutters
- Pneumatic nailer
- Hinge butt router template
- Mitre saw
- Sabre saw
- Portable power plane
- Portable power block plane
- Portable sander
- Extension cords
- Hammer drill

Hand Tools consist of:

- Shovel
- Pick axe
- Spade
- Sledge

Surveying Equipment consists of:

- Level transit
- Builder's level
- Tripod
- Leveling rod