

Residential Finish 120

New  Brunswick

**Department of Education
Educational Programs & Services Branch
2005**

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- Tim Thornton, Oromocto High School



Introduction

Overview

Residential Finish 120 introduces students to the introductory skills and knowledge required to pursue post-secondary learning in the construction trades. Students enrolled in this course are encouraged to work in small groups while achieving specific curriculum outcomes.

Learning Activities

When available, industry/trades representatives should be invited to present to students. Industry representatives provide realistic applications of skills learned. When possible, students plan, draft and build scaled models and small buildings to realize the importance of skill development and safety procedures.

Pre-Requisite

Students must have successfully completed Framing and Sheathing 110.

General Curriculum Outcomes

Upon the completion of Residential Finish and Insulation, students will have achieved the following outcomes:

- GCO 1** Demonstrate the skill and knowledge required to prevent accidents.
- GCO 2** Demonstrate an understanding and application of Workplace Hazardous Materials Information System (WHMIS) symbols.
- GCO 3** Demonstrate an understanding of ethical and legal responsibilities in the construction industry.
- GCO 4** Identify, select and practice safe use of tools and equipment used in the residential finish industry.
- GCO 5** Demonstrate proficiency in measurement and the application of mathematical estimation skills (metric and imperial).
- GCO 6** Identify and interpret various types of working drawings.
- GCO 7** Recognize and understand necessary residential finish industry practices.
- GCO 8** Identify various careers available in the residential/commercial finish industry.
- GCO 9** Recognize the importance of coordination and sequences of sub trades.

Duration

90 hours

Course Code

1037440



RESIDENTIAL FINISH AND INSULATION 120

GCO 1 Demonstrate the skill and knowledge to prevent accidents.

Specific Curriculum Outcomes:

Students will be expected to:

- identify safety procedures and common potential hazards in the lab and workplace
- describe the rationale for first aid kits and an emergency action plan in the working environment
- demonstrate personal responsibility in the prevention of accidents and describe how accidents can be prevented
- demonstrate knowledge of immediate response procedures
- use and store lab materials and tools in a safe manner
- understand the chemical properties of finish materials and applicable solvents
- demonstrate safe body mechanics (i.e. back safety, lifting, etc.)

Suggestions for Teaching/Learning:

The teacher leads a class discussion about personal injury, causes and prevention strategies (include examples of personal injury).

Students work in small groups to analyze workplace accident statistics specific to residential finish work and list how to prevent them. Lists will be shared through class presentations.

The teacher invites a guest speaker from WHSCC or Training and Employment Development to discuss with students why accidents happen, demonstrating preventative steps students/workers should follow to minimize the risk of accidents and possibly injury.

Students tour the school lab to observe safety guards and other measures used in the lab to prevent injury (activity should include appropriate clothing, footwear and eye and ear protection).

Students identify potential accidents associated with selected tools/equipment and finish products located in the lab. Match specific first aid applications and procedures used with each of the possible identified potential accidents.

The teacher explains hazardous situations that can arise when using oil based finishes.

RESIDENTIAL FINISH AND INSULATION 120

GCO 1 Demonstrate the skill and knowledge to prevent accidents.

Suggestions for Learning/Assessment:

The teacher develops an assessment tool to allow students the opportunity to demonstrate an understanding of outcomes.

The teacher observes student conduct in the lab to determine their proficiency in preventing accidents.

The teacher displays finishing materials and related equipment. Students identify, label and describe handling procedures and possible uses.

Through the use of written or PowerPoint presentations, students outline safety precautions followed to prevent injury.

The teacher observes students while they perform simple operations on machines, demonstrating safe practices.

Students analyze workplace situations to determine possible hazards and relate these situations to the school lab.

Students prepare multiple-choice questions pertaining to the power tools used in the lab.

Resources:

Recommended Text

Modern Carpentry

Copyright 2003

Goodheart – Willcox Company, Inc.

Willis H. Wagner, Howard Bud Smith

ISBN 1-59070-202-6

Instructor's Manual Modern Carpentry

Copyright 2003

Goodheart – Willcox Company, Inc.

Willis H. Wagner, Howard Bud Smith, Michael

B. Kopf

ISBN 1-59070-204-2

WHSCC Choices For Life/Health & Safety (K-12) Binder

- Safety procedures for all grades, includes illustrations applying to all subject areas sections: C6-C18,D,E,F,G and H1-H4

Things You Better Know

- Available from NB Workplace Health and Safety Compensation Commission

Phone (800) 442-9776

URL <http://www.whscc.nb.ca>



RESIDENTIAL FINISH AND INSULATION 120

GCO 2 Demonstrate an understanding and application of Workplace Hazardous Materials Information System (WHMIS) symbols.

Specific Curriculum Outcomes:

Students will be expected to:

- apply knowledge of WHMIS symbols to identify hazardous products
- demonstrate an understanding of how to reduce risk of injury or ill health when using hazardous products
- describe the rationale and role of the three parts of WHMIS (labels, symbols, material safety data sheet and worker education training)
- describe the responsibilities of the supplier, the employer and the employee as they relate to WHMIS

Suggestions for Teaching/Learning:

Students use WHSCC statistics to identify body parts most likely to be injured in an accident.

Students generate a list of potentially dangerous finish materials used when working in residential/commercial finishing industry.

Students evaluate statistics on accidents common in the construction industry by matching the body parts most likely to be injured with machines and operations associated with the accidents.

Teacher leads an information session about WHMIS symbols and discusses their relevance. Students construct a chart, to remain on the wall of the lab, illustrating construction finish products on which WHMIS symbols are printed. Teacher illustrates the necessity of having MSDS procedures followed and available for review at all times.

Students access websites of manufacturers of finish materials, solvents, etc. to download material safety data sheet (MSDS).

Teacher explains how to identify hazardous products and what steps to follow when exposed to hazardous materials.

The teacher invites a guest speaker from WHSCC to provide WHMIS training to students.



RESIDENTIAL FINISH AND INSULATION 120

GCO 2 Demonstrate an understanding and application of Workplace Hazardous Materials Information System (WHMIS) symbols.

Suggestions for Learning/Assessment:

Teacher selects portions of the WHSCC materials to develop specific tests relating to items covered in the WHSCC binder.

Teacher integrates evaluation material provided by WHSCC to develop an assessment tool to test students' knowledge of WHMIS.

Students use self-assessment and portfolio development to demonstrate what they have learned about safety. Certificates of merit, photographs and other descriptive methods may be included.

Using multimedia presentations, students profile an understanding of WHMIS safety procedures (PowerPoint Presentation).

Students match WHMIS symbols with potential safety hazards.

Teacher initiates the Safe Start Program.

Resources:

WHSCC Choices For Life / Health & Safety (K-12) Binder

–Safety procedures for all grades, includes illustrations applying to all subject areas
- Available from NB Workplace Health And Safety Compensation Commission
Phone (800) 442-9776
URL <http://www.whscc.nb.ca>

WHSCC - Stay Alive on the Job

- Informative brochure on important facts to take to work
- Available from NB Workplace Health And Safety Compensation Commission
Phone (800) 442-9776
URL <http://www.whscc.nb.ca>

WHSCC - Hazard Alert

- Focused information on accidents; these recommended preventive one page alerts describe real accidents and action
- Available from NB Workplace Health And Safety Compensation Commission
Phone (800) 442-9776
URL <http://www.whscc.nb.ca>

Safe Start/Safety Program

Phone: (506) 444-0175



RESIDENTIAL FINISH AND INSULATION 120

GCO 3 Demonstrate an understanding of ethical and legal responsibilities

<p>Specific Curriculum Outcomes: <i>Students will be expected to:</i></p> <ul style="list-style-type: none">• demonstrate an understanding of applicable concepts including bonds, ethics and liability• identify and demonstrate appropriate legal and ethical behaviour to be followed when engaged in off-site learning activities at residential and commercial establishments• determine the environmental impact of new technologies on the construction sectors	<p>Suggestions for Teaching/Learning:</p> <p>Teacher invites a residential/commercial finishing contractor into the classroom to discuss the concept of liability, stressing ethical protocol while on or using personal property.</p> <p>Students analyze several contractual agreements to differentiate between an estimate and a contract.</p> <p>Students analyze real contractual agreements, identifying the responsibilities of self-employed construction workers while working on a client's property.</p> <p>Students outline activities, attitudes and methods required to communicate effectively when working with members of the community.</p> <p>Students review actual architectural bid forms and job site specifications to determine insurance and contract requirements.</p> <p>Students determine responsibilities the employee has to the employer and the employer has to the employee.</p> <p>Students develop comparison charts describing the differences between an estimate and a contract, identifying specific attributes of both documents.</p>
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RESIDENTIAL FINISH AND INSULATION 120

GCO 3 Demonstrate an understanding of ethical and legal responsibilities in the construction industry.

Suggestions for Learning/Assessment:

Students write an essay to discuss the education and work experience required to start a business in the construction industry (including money management, basic accounting and a generic understanding of market conditions).

Students present information about ethics and liabilities as they relate to the construction industry based on resources from WHSCC (one page HAZARD ALERT) and other related information from the newspaper, etc. These presentations should include case-related questions to be answered by classmates.

Teacher integrates major points of specific contracts provided by local contractors into a generic standard contract that is void of local contractor's names.

Resources:

WHSCC – Stay Alive on the Job

- Informative brochure on important facts to take to work

WHSCC – Hazard Alert

– Focused information on accidents, these one page alerts describe real accidents and recommended preventive action

- Available from NB Workplace Health And Safety Compensation Commission

Phone (800) 442-9776

URL <http://www.whscc.nb.ca>

Workplace statistics concerning employee and employer responsibilities in the workplace

- Available from Training and Employment Development NB

Phone (506) 453-2725

Sample Contract

-Teacher could call the local Chamber of Commerce to access names of local contractors.

- Local Construction Association office
canb4@nbnet.nb.ca



RESIDENTIAL FINISH AND INSULATION 120

GCO 4 Identify, select, and practice safe use of tools and equipment used in the residential finish industry.

Specific Curriculum Outcomes:

Students will be expected to:

- identify and demonstrate safe use of hand tools / power tools and equipment typically used in the residential finish lab and industry
- practice and use tag and lock-out procedures
- maintain, clean and safely store power tools and equipment
- apply finish materials to meet industry standards
- identify, select and use fasteners and adhesives
- demonstrate an understanding of safe work practices when working in elevated situations
- practice and use tools and equipment required for elevation work (ladders, staging), fall arrest equipment (guards) and job specific practices

Suggestions for Teaching/Learning:

Teacher creates an identification exercise/ assignment including:

- name(s) of each tool
- possible safe applications for each tool
- mechanical safe guards and other features the tool is equipped with to prevent accidents
- description of unsafe body positions when using each tool
- labels and numbers of all safety stations and construction equipment/power tools in the lab.

Students identify equipment and list at least two safety precautions when using the equipment (e.g. eye wash solution, fire exit, etc.).

Students demonstrate the safe use of guards on moving parts of equipment.

Teacher invites an individual from WHSCC into the classroom to inform students about potential hazardous situations in the lab.

Students construct a simple project (e.g. wall shelf) following parameters set by the teacher. This activity provides hands on applications for students to develop the necessary knowledge and skills required to operate power hand tools and apply a variety of finish products.

Teacher demonstrates proper procedures for setting up bed planks, work platforms and roof jacks.



RESIDENTIAL FINISH AND INSULATION 120

GCO 4 Identify, select, and practice safe use of tools and equipment used in the residential finish industry.

Suggestions for Learning/Assessment:

Teacher presents students with a floor plan of the lab (void of machines and safety equipment) and asks students to locate and draw related safety areas identifying safety equipment and related procedures.

Student portfolio may be used to track ongoing progress, test scores and skill attainment.

The teacher observes students using tools to identify their level of competence:

- students demonstrate skill level through bench work assignments
- assigned skills include cutting, measuring, sanding, drilling and use of fasteners

This evaluation should be completed in a specific amount of time determined by the teacher. Proficiency of skills and appearance and functionality of projects are considered when calculating a grade. *Students should repeat tool/machine operations until the teacher is confident the student has mastered the operation.*

Resources:

National Building Code of Canada, Binder Format: Latest Edition (550580)
Canadian Housing Information Centre

Carpentry and Building Construction – 5th Edition (550300) Year 1997 Distributor McGraw-Hill Ryerson Ltd.
John L. Feirer, Peter Wilson, 1982
ISBN 0-7730-4301-2

WHSCC Choices For Life / Health & Safety (K-12) Binder
– Safety procedures for all grades, includes illustrations applying to all subject areas: E17-E19

HRDC – *Nine Essential Skills*

http://www15.hrdc-drhc.gc.ca/english/general/Understanding_ES_e.asp



RESIDENTIAL FINISH AND INSULATION 120

GCO 5 Demonstrate proficiency in measurement and the application of mathematical estimation skills (metric & imperial).

Specific Curriculum Outcomes:

Students will be expected to:

- demonstrate an understanding of the standards of measurement, metric and imperial
- apply imperial and metric measurement when reading plans and selecting materials
- use a measuring tape, framing square, combination square and calipers
- demonstrate proficiency when using math to estimate materials and costs
- calculate board feet, linear feet and square feet
- calculate quantities of materials and costs of labour for a project

Suggestions for Teaching/Learning:

Students sort, label and draw small, medium and large objects from within the classroom to illustrate spatial appreciation.

Teacher provides the class with metric and imperial tapes and asks students to measure various selected items using both methods.

Students compare and contrast metric and imperial dimensions.

Students research to determine the standards for the spacing of studs, trusses and floor joists (imperial and metric).

Students estimate roof covering and siding material.

Teacher provides students with the dimensions of an exterior wall and asks them to scale the actual dimensions of the drawing to fit 8 1/2" x 11" paper – students include exterior finish to be applied. (Students may use an architectural scale or measuring tape.)

Students complete suggested exercises from the textbook *Modern Carpentry* to experience the function of, and actually use, a measuring tape, framing square, combination square and calipers.

Students calculate finish materials, drywall, paint, hardwood flooring, door and window trim to finish an interior room and calculate cost. (Dimensions provided by teacher.)



RESIDENTIAL FINISH AND INSULATION 120

GCO 5 Demonstrate proficiency in measurement and the application of mathematical estimation skills (metric & imperial).

Suggestions for Learning/Assessment:

Teacher provides students with the following materials to determine the level of student understanding when calculating, estimating and measuring:

- 8 1/2" x 11" paper
- imperial 12" rule
- architect's scale
- supply list, including costs of materials

Teacher provides students with the dimensions of a floor and wall, instructing them to scale the actual dimensions to fit onto the paper provided (all dimensions are to be included and the drawing is to be centred on the paper).

Students are provided with an orthographic view that is dimensioned in the imperial system. Students convert dimensions to metric.

Teacher provides students with house dimensions and roof and siding material type. Students calculate amounts required in written format.

Teacher provides floor plan and elevations for standard baby barn. Students submit bill of materials for exterior finish only to the teacher.

Teacher provides realistic cost of typical materials for a specific project. Students calculate material cost for assessment.

Resources:

Canadian Home Builders Association
Manual in text format or CD
Contact: (800) 387 2422

Supplementary Text
Carpentry and Building Construction,
5th Edition (550300) Year 1997 Distributor
McGraw-Hill Ryerson Ltd.
John L. Feirer, Gibert R. Hutchings, Peter
Wilson, 1982
ISBN 0-7730-4301-2

Local retailer provides standard material pricing



RESIDENTIAL FINISH AND INSULATION 120

GCO 6 Identify and interpret various types of working drawings.

Specific Curriculum Outcomes:

Students will be expected to:

- demonstrate the ability to use different types of working drawings
- retrieve necessary information from working drawings
- develop a bill of materials and costs
- develop proficiency in measurement (metric and imperial) and apply mathematical estimation skills

Suggestions for Teaching/Learning:

Using a drawing, students construct a story pole to lay out a project.

Students use a framing square to lay out and construct a set of stairs. Instructions for this exercise are as follows:

- Scale project to: $1/4" = 0.1"$
- Rise of step = 7" and tread = 10"
- Cut two risers and stair treads to scale using the appropriate saw for small stock/material. (Use a glue gun for safe and easy assembly.)
- Calculate the board feet of lumber used to make the risers and how many square feet are required to make the stair treads to actual size
- Establish the actual size of steps, identify the type of working drawing required to represent steps and develop a bill of materials stating the materials required to build this project

Teacher explains how mathematical concepts are applied when learning construction concepts such as "rise and run ratio."

Students identify various material symbols used on drawings.

If a client can be secured, the teacher could have students build a set of steps to specific dimensions.

Students locate specific information on blueprints and identify where to retrieve the information.

RESIDENTIAL FINISH AND INSULATION 120

GCO 6 Identify and interpret various types of working drawings.

Suggestions for Learning/Assessment:

Using the following criteria, the teacher observes students to evaluate their knowledge of the appropriate use of a pencil, tri-square and 12" ruler to design a set of steps;

- the number of steps
- the height of each step
- finish floor – finish floor (108")
- side and front view
- scale drawing to fit on paper 8 ½" x 11"

Using the text and resources from contractors, the teacher prepares a test for students to identify and explain building concepts.

Students develop a bill of materials, estimating the work hours required and the safety procedures/precautions involved in applying finish materials on a wall.

Teacher provides an actual set of blueprints that outline specific information to be retrieved.

Resources:

Modern Carpentry
Copyright 2003
Goodheart – Willcox Company, Inc.
Willis H. Wagner, Howard Bud Smith
ISBN 1-59070-202-6

Instructor's Manual Modern Carpentry
Copyright 2003
Goodheart – Willcox Company, Inc.
Willis H. Wagner, Howard Bud Smith, Michael B. Kopf
ISBN 1-59070-204-2

Canadian Home Builders Association
- Manual in text format or CD
Contact: (800) 387-2422

Basic Stair Building
Tauton Press Inc.
Scott Schuttner
ISBN 0-942391-44-6



RESIDENTIAL FINISH AND INSULATION 120

GCO 7 Recognize and understand necessary residential/commercial building practices.

Specific Curriculum Outcomes:

Students will be expected to:

- recognize the application of exterior residential products including roof coverings, siding, windows, doors, soffits, eaves-troughs and decks
- identify and record the uses of interior residential products
- label the finish components of stairs
- recognize the importance of insulation and the vapour barrier
- understand the function of ventilation systems

Suggestions for Teaching/Learning:

Students research health problems associated with poor ventilation.

Students visit a home building centre on their own time to gather information on interior and exterior finish products, including floor and wall coverings, ceiling finishes, trim and doors.

Students research damage due to moisture problems and possible heat loss situations.

The teacher explains the different types of ventilation systems available for residential and commercial construction.

The teacher invites in a flooring expert to demonstrate the installation procedures of various flooring systems.

Students, working in small groups, lay out and install tar paper and roofing shingles on a sheet of roofing plywood.

Teacher initiates the building of mock-ups for students to experience the application of residential finish products.



RESIDENTIAL FINISH AND INSULATION 120

GCO 7 Recognize and understand necessary residential/commercial building practices.

Suggestions for Learning/Assessment:

Teacher assesses student presentations on ventilation and vapour barrier research.

Students share their findings from the visit to the home building centre and display possible samples.

Students complete written assignments demonstrating knowledge of finish products and installation procedures.

Students will be marked on practical work completed in the school lab emphasizing quality, speed, safety and cleanliness.

Resources:

Canadian Wood Frame House Construction
Produced by CMHC

ISBN 0-660-17294-1

Website www.cmhc-schl.gc.ca

Phone (800) 668-2642

Fax (800) 245-9274

Carpentry, Fourth Edition

Copyright 2004 by American Technical Publishers, Inc.

Nelson Thomson Learning Canada

Leonard Koel

ISBN 0-8269-0738-5



RESIDENTIAL FINISH AND INSULATION 120

GCO 8 Identify various careers available in the residential/commercial finish industry.

Specific Curriculum Outcomes:

Students will be expected to:

- understand the need for teamwork, effective communication and essential skills required for all jobs
- gain insight into the required and desirable skills needed to achieve a career in the residential/commercial construction industry
- understand the importance of math and communication skills within the residential/commercial finishing industry as well as the work experience requirements for entry level opportunities
- become familiar with the variety of career opportunities in the residential/commercial finishing industry

Suggestions for Teaching/Learning:

Students contact a human resource representative from a local contractor or community college to gain insight into what types of learning experiences and high school courses would be most beneficial when choosing a career in the residential/commercial finish industry.

Working in small groups, students conduct informal research to determine conventional and new emerging career clusters in the construction sectors (e.g. telematics, intelligent systems and smart house designs).

Using the Internet, newspapers and other sources, students gain insight into the job and career opportunities in the residential/commercial finish industry.

Teacher explains the importance of “employability skills profile” as presented by the Conference Board of Canada.

Teacher initiates a discussion with students concerning the many career options in the construction industry, including the integration of engineering, computer science and other post secondary programs.

RESIDENTIAL FINISH AND INSULATION 120

GCO 8 Identify various careers available in the residential/commercial finish industry.

Suggestions for Learning/Assessment:

Students list five careers found in the residential/commercial finishing industry, listing possible post-secondary degrees or diplomas required to prepare them for the specific career paths they have listed.

Using the Internet, electronic data and/or interviews with industry persons, students conduct research in a particular career area of interest. Students build a multimedia presentation demonstrating the opportunities, educational challenges and economic benefits when choosing a career path in the residential/commercial finishing industry.

Students complete a self-directed assessment exercise, recording activities on daily progress cards and focused portfolio development.

Using selected sections of the textbook, students identify the required skills and knowledge to work in the residential/commercial finishing industry.

Resources:

Carpentry and Building Construction, 5th Edition (550300) Year 1997

Distributor: McGraw-Hill Ryerson Ltd.
John L. Feirer, Gilbert R. Hutchings, Peter Wilson, 1982
ISBN 0-7730-4301-2

WHSCC Choices For Life/Health & Safety (K-12) Binder

- Safety procedures for all grades, includes illustrations applying to all subject areas - B2 B7, C, E4

- Available from NB Workplace Health and Safety Compensation Commission

Phone: (800) 442-9776

URL: <http://www.whscc.nb.ca>



RESIDENTIAL FINISH AND INSULATION 120

GCO 9 Recognize the importance of coordinating the sub trades.

Specific Curriculum Outcomes:

Students will be expected to:

- recognize the sequential order required for sub-systems
- practice the teamwork required for efficient building construction

Suggestions for Teaching/Learning:

Students identify all trades involved in the construction of a three bedroom bungalow.

Students develop a time line and task schedule for a three bedroom bungalow.

Students, divided into teams, research sub-trades (heating systems, plumbing, etc.).

RESIDENTIAL FINISH AND INSULATION 120

GCO 9 Recognize the importance of coordination and sequences of sub trades.

Suggestions for Learning/Assessment:

Students prepare and present a written submission outlining the sub trades and describing the sequence followed when building a three bedroom bungalow.

Students participate in a class presentation while teacher performs observation assessment.

Resources:

Glencoe Carpentry & Building Construction Instructor Resource Guide

Glencoe Carpentry & Building Construction Carpentry Applications
ISBN 0-07-822703-8

Glencoe Carpentry & Building Construction
Mark D. Feirer, John L. Feirer
ISBN 0-07-822702-X

Glencoe Carpentry & Building Construction Carpentry Math
ISBN 0-07-8253353-5

Modern Carpentry Building Construction Details in Easy-to-Understand Form
ISBN 1-56637-569-X

