Carpenters:

NOC 7271

Introduction

Carpenters construct, erect, install, maintain and repair structures and components of structures made of wood, wood-substitutes and other materials. They are employed by construction companies, carpentry contractors, maintenance departments of factories, plants and other establishments, or they may be self-employed.

The most important Essential Skills for Carpenters are:

- Document Use
- Numeracy
- Problem Solving

Document Sections

- Reading Text
- Document Use
- Writing
- Numeracy
- Oral Communication
- Thinking Skills
    - Problem Solving
    - Decision Making
    - Critical Thinking
    - Job Task Planning and Organizing
    - Significant Use of Memory
    - Finding Information
- Working with Others
- Computer Use
- Continuous Learning
- Notes

A. Reading Text

Reading Text

Tasks	Complexity Level	Examples
Typical	1 to 3	Carpenters: • read project specifications to understand project requirements. (2) , (occasionally) • read and interpret specifications already covered in item 5 below. (2) , (frequently) • read specification books, details and notes on blueprints and codes specified by architectural and engineering drawings. (2) , (frequently) • read newsletters to stay abreast of news from their union (e.g., training opportunities), management (e.g., policies, project facts and figures) and industry (e.g., trade shows). (2) , (monthly) • may read collective agreements to identify agreements made between labour and management such as working conditions and housekeeping responsibilities. (2) , (occasionally) • read and interpret first aid and safety reports and minutes. (2) , (frequently) • read and interpret safety inspection manuals. (2) , (frequently) • read and interpret building codes, regulations and standards to comply with national, provincial and municipal regulations. (3) , (frequently)
Most Complex	3	• read and interpret Occupational Health and Safety Regulations as they apply to safe work practices. (3) • read installation manuals to follow manufacturers' installation procedures. (3) , (frequently) • read industry trade magazines to acquire information on technological advancements such as new construction materials and methods, computerized plan design and energy efficiency. (3) , (monthly) • read material safety data sheets (MSDS) to identify the chemical composition of materials, how to use them safely and emergency first-aid procedures. (3) , (occasionally) • read and interpret specific job safety manuals. (3) • read and interpret job legislation literature. (3) , (occasionally)

Reading Summary

The symbol √ is explained in the Use of Symbols section.

	Purpose for Reading			
Type of Text	**To scan for specific information/To locate information**	**To skim for overall meaning, to get the 'gist'**	**To read the full text to understand or to learn**	**To read the full text to critique or to evaluate**
Forms	√	√	√	
Labels	√	√	√	
Notes, Letters, Memos	√	√	√	√
Manuals, Specifications, Regulations	√	√	√	√
Reports, Books, Journals	√	√	√	√

B. Document Use

Document Use

Tasks	Complexity Level	Examples
Typical	1 to 4	Carpenters: • interpret labels (e.g., Workplace Hazardous Materials Information System (WHMIS)), to follow safety guidelines. (1) , (frequently) • interpret signs to obtain information about directions, cautions and safety. (1) , (frequently) • use time cards to record work hours and times for payroll. (1) , (frequently) • read packaging labels for specific points of information. (1) • interpret specifications and shop drawings for size, location and types of material. (2) • read job schedules to plan work tasks and co-ordinate with sub-trades. (2) , (frequently) • refer to pictures or drawings of international hand signals in training documents and posters to refresh signalling skills. (2) • prepare material lists in table format. (2) • interpret electrical, mechanical and other trade drawings to co-ordinate work. (3) , (occasionally)
Most Complex	4 to 4	• make sketches of drawings or plans to use on job sites. (3) , (frequently) • refer to load charts to determine load bearing capacities when operating material handling equipment. (3) • complete forms, for example, when applying for work permits. (3) • interpret blueprints, with a high degree of accuracy, to verify measurements, determine the integrity of the plans and report mistakes or omissions. (4) , (frequently)

Document Use Summary

- Read signs, labels or lists.
- Complete forms by marking check boxes, recording numerical information or entering words, phrases, sentences or text of a paragraph or more. The list of specific tasks varies depending on what was reported.
- Read completed forms containing check boxes, numerical entries, phrases, addresses, sentences or text of a paragraph or more. The list of specific tasks varies depending on what was reported.
- Read tables, schedules or other table-like text (e.g., read work shift schedules).
- Create tables, schedules or other table-like text.
- Enter information on tables, schedules or other table-like text.
- Obtain specific information from graphs or charts.
- Interpret information on graphs or charts.
- Recognize common angles such as 15, 30, 45 and 90 degrees.
- Draw, sketch or form common shapes such as circles, triangles, spheres, rectangles, squares, etc.
- Interpret scale drawings (e.g. blueprints or maps).
- Take measurements from scale drawings.
- Read assembly drawings (e.g. those found in service and parts manuals).
- Create assembly drawings.
- Read schematic drawings (e.g. electrical schematics).
- Make sketches.
- Obtain information from sketches, pictures or icons (e.g., computer toolbars).

C. Writing

Writing

Tasks	Complexity Level	Examples
Typical	1 to 3	Carpenters: • maintain a job diary to record job information and the relevant details of their day's work such as problems encountered and resolved, hours of work, etc. (1) , (daily) • maintain a field book to record descriptions of surveyors' notes, elevation data, etc. (2) , (occasionally) • write document quantity take-offs. (2) • write purchase orders to obtain materials. (2) , (occasionally) • write change orders to recommend blueprint modifications. (2) , (occasionally) • complete forms to obtain permits. (2) , (occasionally)
Most Complex	3	• write scaffolding maintenance reports when changes are made by other workers (e.g., ironworker) to determine what needs to be put back. (2) , (occasionally) • complete exposure report forms to comply with safety regulations. (2) , (occasionally) • write construction safety reports. (2) • write accident reports for occupational and safety. (2) • write evaluation reports on apprentices who have been assigned to them on the job. (3) • prepare written reports for construction project meetings in which they participate. (3) , (occasionally)

Writing Summary

The symbol √ is explained in the Use of Symbols section.

	Purpose for Writing						
Length	**To organize/ to remember**	**To keep a record/to document**	**To inform/ to request information**	**To persuade/ to justify a request**	**To present an analysis or comparison**	**To present an evaluation or critique**	**To entertain**
Text requiring less than one paragraph of new text	√	√	√	√			
Text rarely requiring more than one paragraph	√	√	√	√			
Longer text							

D. Numeracy

The symbol √ is explained in the Use of Symbols section.

Numeracy

Tasks	**Complexity Level**	**Examples**
√ Money Math	1 to 3	Carpenters: • verify the accuracy of their pay cheques. (Money Math), (2) , (frequently) • verify bills when purchasing tools, calculating discounts for sale items and applicable taxes. (Money Math), (3) , (frequently) • make effective use of time and money by managing their own time and that of others (e.g., labourer) and reducing waste. (Scheduling, Budgeting & Accounting Math), (2) , (daily)
√ Scheduling, Budgeting & Accounting Math	2	

√ Measurement and Calculation Math	1 to 4	• schedule material to meet project requirements. (Scheduling, Budgeting & Accounting Math), (2) , (frequently) • convert between metric and imperial measurements systems (e.g., feet to meters, kilograms to pounds) as required by the job. (Measurement and Calculation Math), (2) , (frequently)
√ Data Analysis Math	1 to 3	• calculate and estimate the volume of concrete required for footings, etc. (Measurement and Calculation Math), (2) , (frequently) • calculate slope to determine the placement of drainage tiles. (Measurement and Calculation Math), (3) , (frequently) • take precise measurements using survey instruments. (Measurement and Calculation Math), (3) , (frequently) • make scale drawings. (Measurement and Calculation Math), (3) , (frequently)
√ Numerical Estimation	1	• calculate stringers, treads and risers to build stairs. (Measurement and Calculation Math), (4) , (frequently) • calculate the rafter line length using the measurements of rise and run. (Measurement and Calculation Math), (4) , (frequently) • compare site data to data in span tables to determine sizes of joists, beams, rafters and lintels. (Data Analysis Math), (1) , (occasionally) • average geotechnical survey data for excavations to draw conclusions about safety. (Data Analysis Math), (3) , (occasionally) • estimate how long it will take to complete part of a job. (Numerical Estimation), (1) , (frequently) • estimate whether a wall is straight by eyeballing it. (Numerical Estimation), (1)

Math Skills Summary

a. Mathematical Foundations Used

The symbol √ is explained in the Use of Symbols section.

Mathematical Foundations Used

Code	Tasks	Examples
	Number Concepts	
√	Whole Numbers	Read and write, count, round off, add or subtract, multiply or divide whole numbers. For example, reading measuring tapes, ordering lumber.
√	Integers	Read and write, add or subtract, multiply or divide integers. For example, measuring elevations above and below grade.
√	Rational Numbers - Fractions	Read and write, add or subtract fractions, multiply or divide by a fraction, multiply or divide fractions. For example, using half inches or feet when measuring layouts.
√	Rational Numbers - Decimals	Read and write, round off, add or subtract decimals, multiply or divide by a decimal, multiply or divide decimals. For example, using decimals to record partial units for measurement, such as 6.4 meters.
√	Rational Numbers - Percent	Read and write percents, calculate the percent one number is of another, calculate a percent of a number. For example, calculating taxes on tool purchases; representing a slope as a percentage (e.g., a roof with a 30% slope).
√	Equivalent Rational Numbers	Convert between fractions and decimals or percentages. Convert between decimals and percentages. For example, changing percent containing a common fraction (e.g., 22½%) to a decimal in order to use it in calculations.
√	Other Real Numbers	Use powers and roots, scientific notation, significant digits. For example, calculating measurements of right angle triangles.

Code	Tasks	Examples
		Patterns and Relations
√	Equations and Formulae	Solve problems by constructing and solving equations with one unknown. Use formulae by inserting quantities for variables and solving. Write, simplify and solve two variable algebraic problems. For example, calculate area of a square using the formula A = s2.
√	Use of Rate, Ratio and Proportion	Use a ratio showing comparison between two quantities with the same units. Use a proportion showing comparison between two ratios or rates in order to solve problems. For example, mixing concrete in a specified ratio of cement to gravel. Using scale drawings.
		Shape and Spatial Sense
√	Measurement Conversions	Perform measurement conversions. For example, converting kilograms to pounds or inches to millimeters.
√	Areas, Perimeters, Volumes	Calculate areas. Calculate perimeters. Calculate volumes. For example, calculate volume of concrete required.
√	Geometry	Use geometry. For example, bracing rafters.
√	Trigonometry	Use trigonometry. For example, calculating angles when building a circular staircase or calculating the amount of cable necessary to brace a rafter. Recognizing common angles. Drawing, sketching and forming common forms and figures.
		Statistics and Probability
√	Summary Calculations	Calculate averages. Calculate rates other than percentages. Calculate proportions or ratios. For example, averaging levels of elevations when surveying, rate of pour for concrete placement. Using tables, schedules or other table-like text. Using graphical presentations

b. How Calculations are Performed

- In their heads. framing squares.
- Using a pen and paper. framing squares.
- Using a calculator. framing squares.
- Using other devices, such as framing squares.

c. Measurement Instruments Used

- Time. For example, using a watch or clock.
- Weight or mass. For example, using a scale.
- Distance or dimension. For example, using a tape measure, surveyor's chain or architect's/engineer's scale.
- Liquid volume. For example, using a graduated bucket.
- Temperature. For example, using a thermometer.
- Pressure. For example, using a pressure gauge.
- Angles. For example, using a protractor, framing square or survey instruments.
- Slope. For example, using a hand level, transit, builder's level or theodolite.
- Use the SI (metric) measurement system.
- Using the imperial measurement system.

E. Oral Communication

Oral Communication

Tasks	Complexity Level	Examples
Typical	1 to 2	Carpenters: • interact with personnel delivering materials to accept deliveries and direct the placement of materials for maximum efficiency. (1) , (frequently) • interact with suppliers to order materials or compare prices. (1) • interact with other carpenters to allocate work tasks, express safety concerns and share ideas. (2) , (frequently) • interact with other trades to co-ordinate construction activities. (2) , (frequently) • communicate with foremen to report on work progress and troubleshoot problems. (2) , (frequently) • interact with management/supervisor to receive direction. (2) , (frequently)
Most Complex	1 to 3	• interact with government inspectors to discuss compliance with regulations and related issues. (2) , (occasionally) • interact with material testing agency personnel. (2) • speak with manufacturer representatives, in person and by phone, to discuss problems with equipment (e.g., air nailers) and materials. (2) , (occasionally) • interact with apprentices to provide direction and monitor their work. (3) , (frequently) • interact with owner to discuss new ideas and potential changes. (3) , (frequently) • communicate with engineers, architects and design consultants to receive direction. (3)

Modes of Communication Used
No data available for this occupation.

Environmental Factors Affecting Communication
Significant environmental factors affecting oral communication were not reported by job incumbents.

Oral Communication Summary

The symbol √ is explained in the Use of Symbols section.

	Purpose for Oral Communication (Part I)					
Type	**To greet**	**To take messages**	**To provide /receive information, explanation, direction**	**To seek, obtain information**	**To co-ordinate work with that of others**	**To reassure, comfort**
Listening (little or no interaction)		√	√			
Speaking (little or no interaction)	√		√			√
Interact with co-workers		√	√	√	√	√
Interact with those you supervise or direct			√	√	√	√
Interact with supervisor/ manager			√	√	√	√
Interact with peers and colleagues from other organization						
Interact with customers/ clients/ public	√		√	√	√	√
Interact with suppliers, servicers			√	√	√	
Participate in group discussion			√	√	√	
Present information to a small group			√	√	√	
Present information to a large group			√			

The symbol √ is explained in the Use of Symbols section.

	Purpose for Oral Communication (Part II)					
Type	**To discuss (exchange information, opinions)**	**To persuade**	**To facilitate, animate**	**To instruct, instill understanding, knowledge**	**To negotiate, resolve conflict**	**To entertain**
Listening (little or no interaction)						
Speaking (little or no interaction)						
Interact with co-workers	√	√	√	√	√	
Interact with those you supervise or direct	√	√	√	√	√	
Interact with supervisor/ manager	√	√		√	√	
Interact with peers and colleagues from other organization						
Interact with customers/ clients/ public	√	√		√	√	
Interact with suppliers, servicers	√	√			√	
Participate in group discussion	√		√	√	√	
Present information to a small group	√	√		√	√	
Present information to a large group						

F. Thinking Skills

1. Problem Solving

Problem Solving

Tasks	Complexity Level	Examples
Typical	1 to 3	Carpenters: • may find that the concrete vibrator has a power outage, putting the concrete work at risk. Carpenters immediately pull together other trades to assist with this time sensitive situation. They improvise in selecting and initiating interim measures, such as beating the forms with hammers, while interacting with the foreman to get the generator up and running. If the supervisor is not available in a timely manner and a replacement generator is required, carpenters may authorize the order. (2) • may find that the work area has restricted access and the carpenter is working in a confined space. Performing routine tasks becomes complex because standard procedures must be adapted to accommodate the space limitations. A carpenter will often consult with another carpenter and the foreman to exchange ideas and select the best approach. (2) • may find that by comparing measurements taken from blueprints to measurements taken on site, a carpenter concludes that there is a blueprint error or omission. Carpenters draw on expert-level blueprint interpretation and measurement skills to identify problems. Typically, they verify their findings with another carpenter. Carpenters draw on their technical expertise to recommend changes to the foreman and implement them accordingly. (3) • may find that there is a form blow out which presents an immediate safety hazard with scheduling and budgeting implications. Carpenters work quickly to minimize the safety risks to themselves and other workers in the area. They then take measures to stop the damage from proceeding further. This type of problem requires carpenters to demonstrate leadership and collaborate with everyone in the area. (3)
Most Complex	3	

2. Decision Making

Decision Making

Tasks	Complexity Level	Examples
Typical	1 to 3	Carpenters: • make decisions about assessing the efficient use of materials, considering factors such as the end-use. (3) • make decisions about constructing and building structures such as decks, stairs and platforms. (3) • make decisions about directing the work of apprentices. (3)
Most Complex	3	

3. Critical Thinking

Critical Thinking information was not collected for this profile.

4. Job Task Planning and Organizing

Job Task Planning and Organizing

Complexity Level	Examples
3	Own job planning and organizing • Carpenters have variety in their work activities across various residential, commercial and industrial projects. Their work priorities are determined by the owner, architectural and structural drawings, project specifications, acts and regulations. Carpenters determine the task sequence in accordance with standard trade practices and the progress of work on site. They order tasks for efficiency and take a leadership role in promoting productivity and reducing waste. The work plan of carpenters is highly integrated with the work of other trades requiring ongoing integration through effective communication and teamwork. There are recurring irregularities (e.g., equipment breakdowns, poor weather) that require them to adjust their daily schedules.

5. Significant Use of Memory

Examples

- recall the way a scaffold was assembled to correctly disassemble it and vice versa.
- recall measurements taken from blueprints to verify them with site data.
- recall prior experiences with equipment failures to efficiently solve current job-site problems.
- memorize formulae to perform math calculations.
- memorize frequently used national, provincial and municipal codes, regulations and standards, as well as any related changes, to comply with requirements.
- memorize sequencing of trade and work procedures.

6. Finding Information

Finding Information

Tasks	Complexity Level	Examples
Typical	2 to 3	Carpenters: • consult with other carpenters to share their knowledge and experience. (2) • refer to blueprints and specifications to obtain detailed project information. (2) • read Material Safety Data Sheets (MSDS) to obtain information on how to safely handle materials and supplies. (2) • read installation manuals and, if necessary, phone manufacturer representatives to understand the manufacturers' installation procedures. (3)

G. Working with Others

Participation in Supervisory or Leadership Activities

No data available for this occupation.

H. Computer Use

Computer Use

Tasks	Complexity Level	Examples
Typical	1	Carpenters: • they may use computer-controlled equipment such as total stations, smart levels and workplace alarm systems.

Computer Use Summary

• Use computer-assisted design, manufacture or machining.

I. Continuous Learning

How Learning Occurs

Learning may be acquired:

- As part of regular work activity.
- From co-workers.
- Through training offered in the workplace.
- Through reading or other forms of self-study
    - at work.
    - on worker's own time.
    - using materials available through work.
    - using materials obtained through a professional association or union.
    - using materials obtained on worker's own initiative.
- Through off-site training
    - during working hours at no cost to the worker.
    - partially subsidized.
    - with costs paid by the worker.

J. Other Information

In addition to collecting information for this Essential Skills Profile, our interviews with job incumbents also asked about the following topics.

Attitudes
Carpenters should be very safety conscious and capable of maintaining this attitude at all times. They should be reliable, responsible, productive and have pride in the quality of their work. Honesty and respect are essential as is the ability to co-operate with others. Carpenters are leaders at the construction site and an assertive style of communication is helpful in this regard.

Future Trends Affecting Essential Skills
The construction industry is experiencing rapid changes due to technological advancements and a changing regulatory framework. Carpenters must incorporate new skills and knowledge with traditional methods of construction, placing a new emphasis on continuous learning. The industry is characterized by the ongoing introduction of new construction materials and methods and this trend is expected to continue with increasing frequency. Government regulations are revised more often than in the past and carpenters must maintain current knowledge of codes, regulations and standards. To promote the integration of under represented workers (e.g., women), there may also be more training related to enhanced communication and teamwork skills. It is expected that computer skills at a higher level of complexity will soon become an essential occupational skill, enabling carpenters to electronically reference plans and designs. Distance learning technologies may also provide carpenters with opportunities to participate in computer-mediated training activities. Due to insurance liability concerns, industry experts expect that Red Seal certification will be used more often and that written tests will be used to prove mastery. This increases the frequency of reading text and documents to acquire new information as well as applying learning-to-learn skills such as studying, note-taking and writing multiple-choice tests. There is an ongoing trend in the carpentry industry to promote and expand apprenticeship as well as to increase the awareness of such programs to K-12 students. This will require carpenters to enhance their communication skills.

K. Notes

This profile is based on interviews with job incumbents across Canada and validated through consultation with industry experts across the country.
For information on research, definitions, and scaling processes of Essential Skills Profiles, please consult the Readers' Guide to Essential Skills Profiles (http://www.hrsdc.gc.ca/eng/jobs/les/profiles/readersguide.shtml).