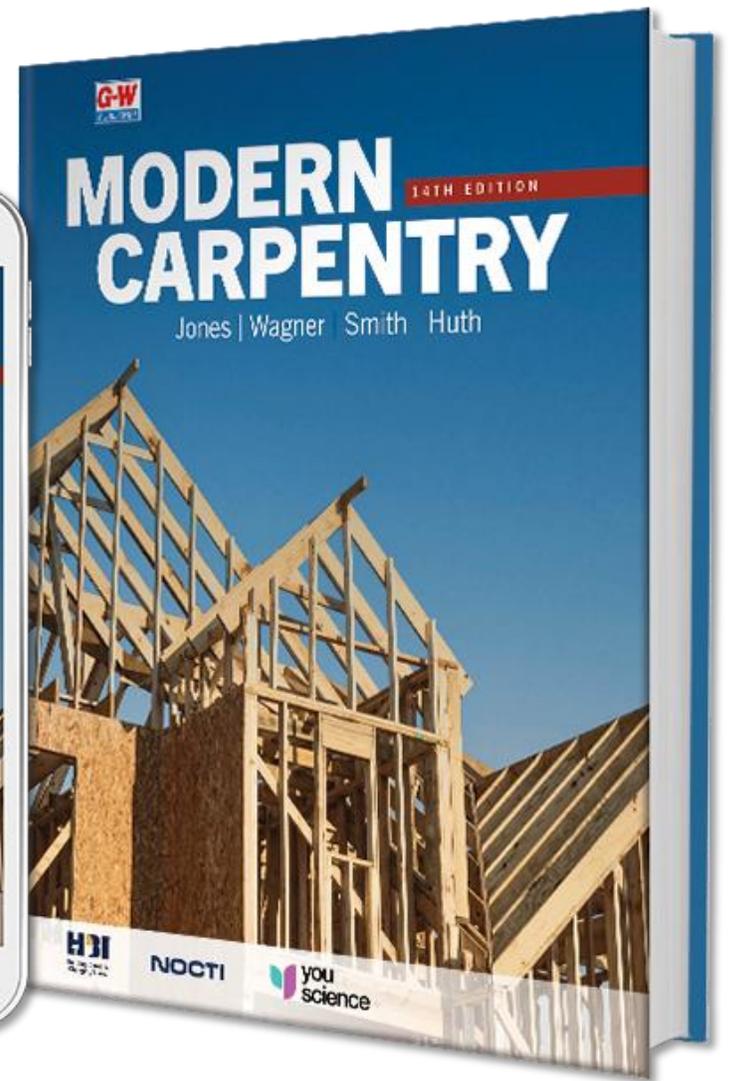
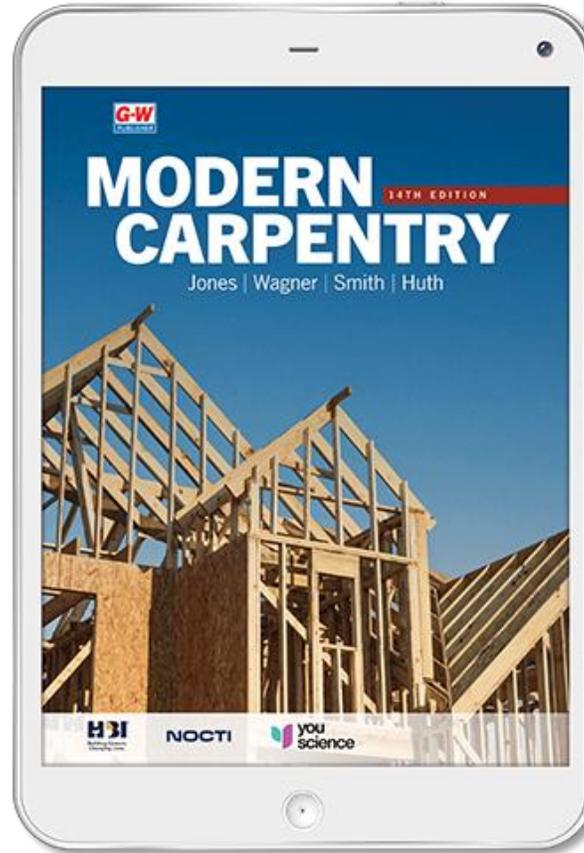


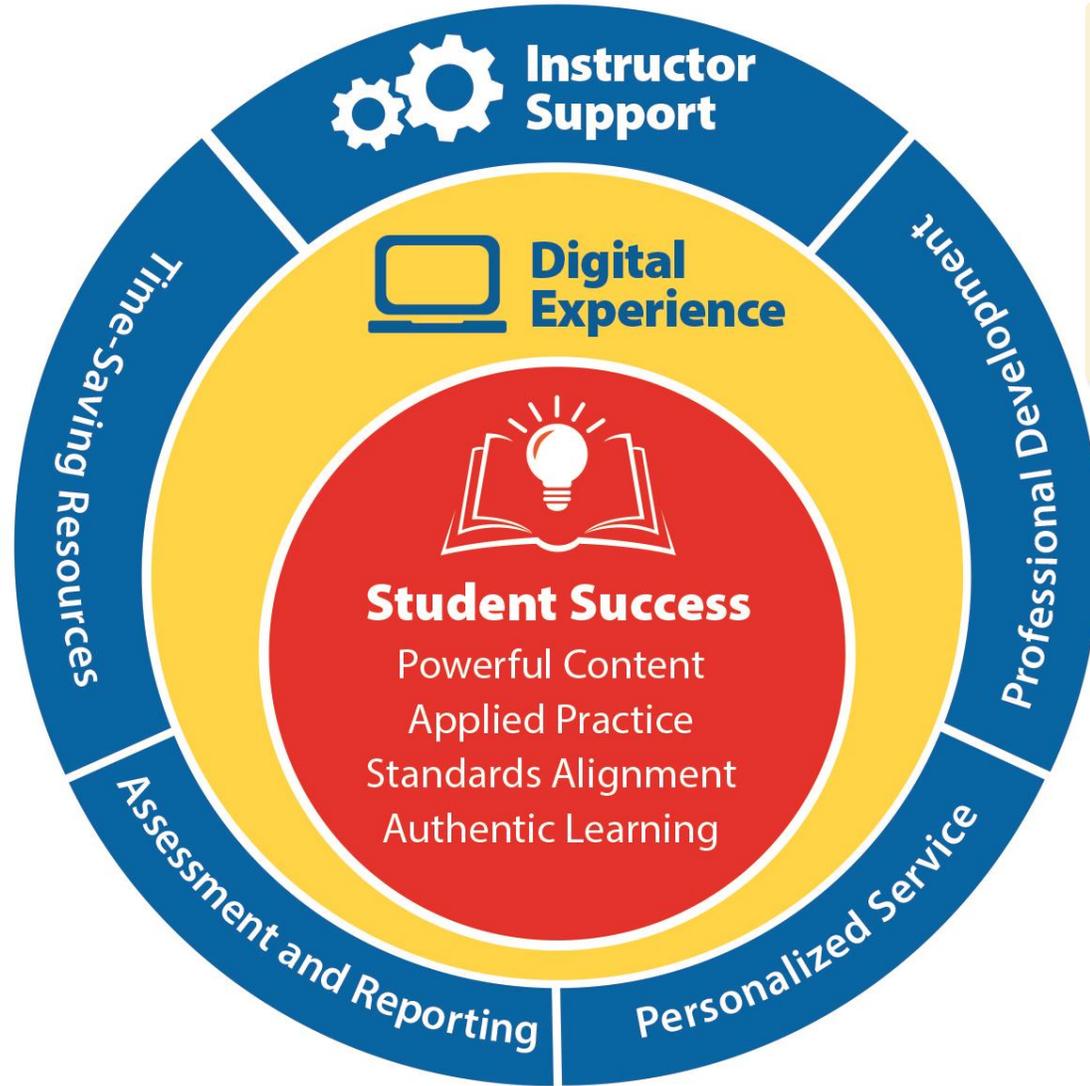
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Modern Carpentry



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Aligned to Standards: Student Success Is At the Heart of What We Do



- ✓ Prepare for class
- ✓ Reinforce new concepts
- ✓ Assess learning

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Resource Materials

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- [🔗 Release Notes \(Updated 11/12/2024\)](#)
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Modern Carpentry: Lesson Plan

Instructor:

Date:

Course:

Unit:

Chapter 1: The Carpenter's Workplace

Learning Outcomes

- 1.1 Economic Outlook
 - 1.1-1 Cite the projected demand for carpenters in coming years.
- 1.2 Working Conditions
 - 1.2-1 Recognize the working conditions for carpenters.
- 1.3 Job Opportunities
 - 1.3-1 List potential job opportunities for a trained carpenter.
- 1.4 Training
 - 1.4-1 Describe the sequence of carpentry training and apprenticeship.
- 1.5 Applying for a Position
 - 1.5-1 Explain the criteria required in a professional résumé, cover letter, and job application.
 - 1.5-2 Prepare for a job interview.
- 1.6 Succeeding in the Workplace
 - 1.6-1 Discuss abilities and characteristics needed by those in the carpentry field.
- 1.7 Entrepreneurship
 - 1.7-1 Describe the advantages and disadvantages of being an entrepreneur.
 - 1.7-2 Identify some important laws and regulations an entrepreneur must comply with when operating a business.
- 1.8 Career Advancement
 - 1.8-1 Recognize ways to seek career advancement as a carpenter.
- 1.9 Carpentry-Related Occupations
 - 1.9-1 List other occupations that are related to carpentry.
- 1.10 Organizations Promoting Construction Training
 - 1.10-1 Identify organizations that promote construction training.

Code Note

- A well-trained carpenter is expected to know the requirements of local building codes. These codes dictate where materials may be used and how a structure is to be built. Failure to follow the codes can prove costly, since inspectors may require work that does not meet code requirements to be redone. This means more time and money spent on materials and labor.

Lesson Plans, PowerPoint Presentations, and Answer Keys

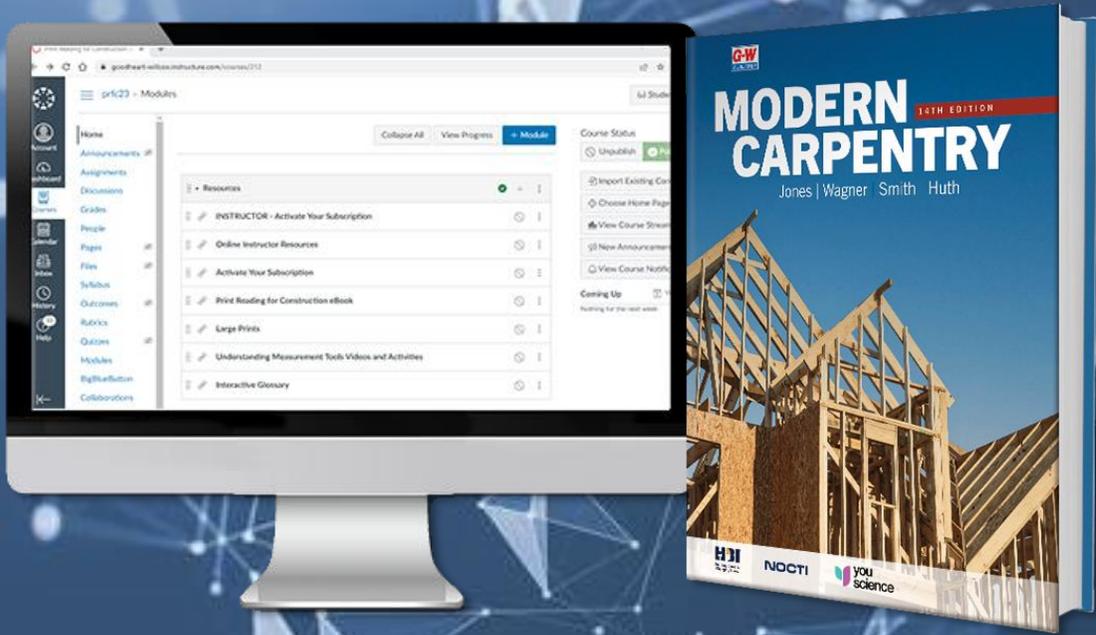


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2: E-Flash Cards

Definition (1 of 31)

Item of value that is owned.

2: E-Flash Cards

Term (1 of 31)

asset

Select to flip

Previous Remove Next

E-Flash Cards & Vocabulary Practice

2: Vocabulary Game

Select a point value. Choose the term that matches the definition.

Score: 800

<input checked="" type="radio"/> 100	100	100	100
200	200	200	200
300	<input checked="" type="radio"/> 300	300	300
400	400	400	<input checked="" type="radio"/> 400

Definition: Act of giving money, goods, or services to meet the needs of others and support causes that are important to an individual.

- pay yourself first
- variable expense
- recordkeeping
- philanthropy

Check Answer

Interactive Activities

Name:
Date:
Class:

Chapter 1: The Carpenter's Workplace

Carefully study the chapter and then answer the following questions.

- The number of carpenters employed in the United States is expected to ____ over the next several years.
 - decrease
 - remain about the same
 - increase
 - vary

Answer:

- Some of the highest-paying carpentry jobs are in _____.
 - residential construction
 - surveying
 - promoting of performing arts and sports
 - bricklaying

Answer:

- True or False?* All carpenters are expected to follow OSHA standards when on the job.

Answer:

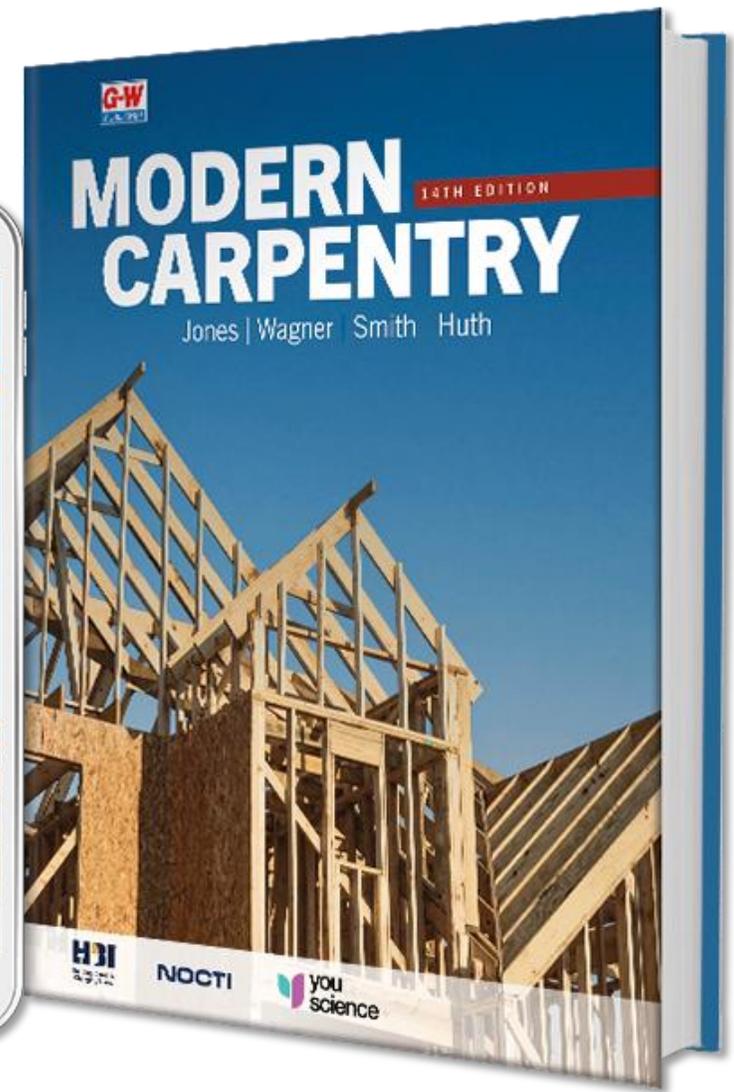
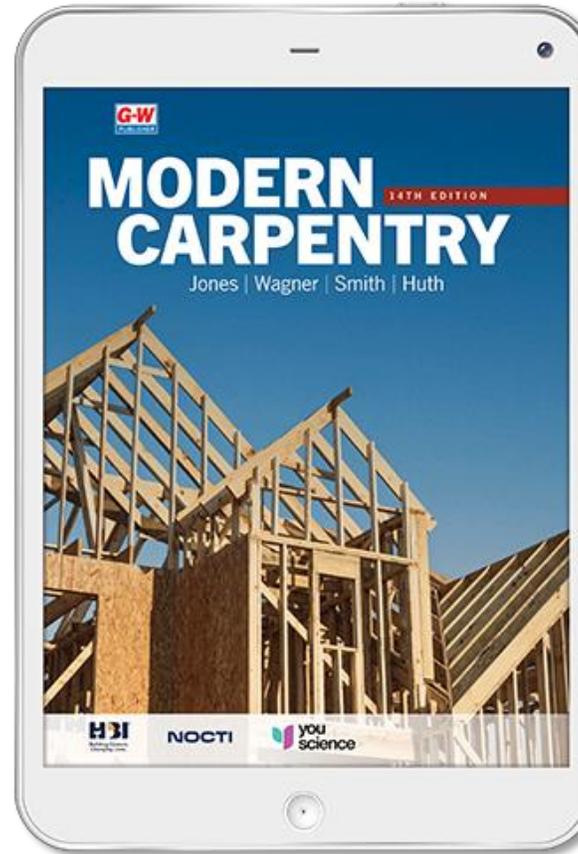
- The majority of carpenters work in _____.
 - remodeling, maintenance, and renovations
 - building construction
 - prefabrication of buildings
 - specialized carpentry fields

Answer:

Workbook Activities

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Student Textbook

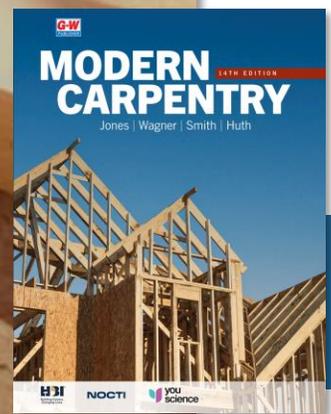


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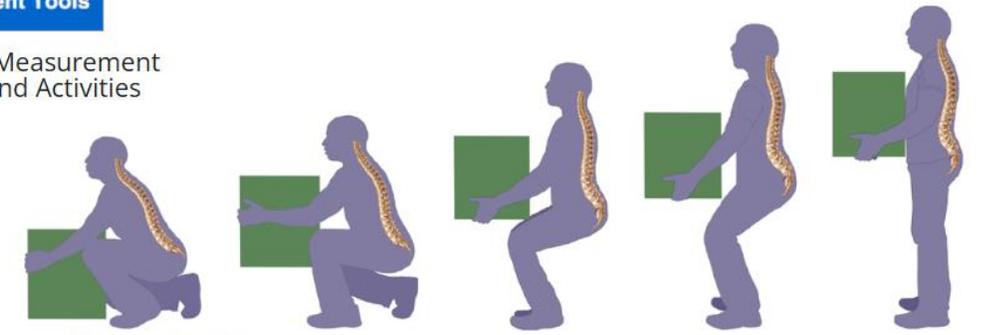


Understanding Measurement Tools

Understanding Measurement Tools Videos and Activities



Common Interview Questions and Responses	
Question	Response
What can you tell me about yourself?	Briefly summarize your abilities as they relate to the job qualifications or your career goals. Do not provide a general life history.
Why do you want to work for this company?	Tell what you know about the company. Explain how your abilities match the company's needs.
Why do you think you would like this kind of work?	Relate the job requirements to your successful past experiences.
What are some of the projects you worked on in school?	Briefly summarize a project or coursework relevant to the job qualifications.
What other jobs have you had?	Focus on jobs with skills that relate to the jobs you are seeking.
Why did you leave your last job?	Be honest. However, avoid saying anything negative about your previous employer.



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Figure 2-4. Proper lifting and carrying techniques are important to avoid

What's New to the Edition



CHAPTER 3

Building Materials

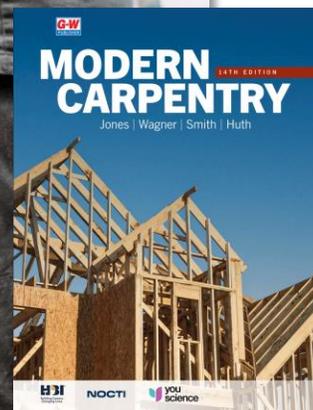
LEARNING OUTCOMES

After studying this chapter, you will be able to:

- 3.1-1 Define lumber and how it is used in construction.
- 3.2-1 Describe the structure of wood and how it grows.
- 3.3-1 Explain the hardwood and softwood classifications of lumber.
- 3.3-2 Recognize the different ways lumber can be cut.
- 3.4-1 Explain moisture content (MC), equilibrium moisture content (EMC), and how moisture levels are manipulated in lumber.
- 3.5-1 Identify common defects in lumber.
- 3.5-2 Define lumber grading terms.
- 3.6-1 Calculate lumber sizes according to established industry standards.
- 3.7-1 Explain plywood, OSB, composite board, particleboard, and hardboard grades and uses.
- 3.8-1 List precautions to observe while working with treated lumber.
- 3.9-1 Identify proper methods of handling and storing lumber.
- 3.10-1 Identify types of engineered lumber and list their uses and advantages.
- 3.11-1 Discuss the uses of light gauge steel framing.
- 3.11-2 Identify a variety of metal framing connectors and indicate where each is used.
- 3.12-1 Identify common fasteners and bonding agents used in construction.

TECHNICAL TERMS

annular ring	faces	lumber	premium grade
blue stain	factory and shop lumber	lumber core	pressure-treated lumber
board foot	FAS (firsts and seconds)	mastic	quarter-sawed
bound water	fiber saturation point	moisture content (MC)	sapwood
cambium	flat-grained	No. 1 common	seasoning
casein glue	free water	open-grain wood	select
composite board	glue-laminated beam (glulam)	open time	shake
conifer	hardboard	oriented strand board (OSB)	span rating
contact cement	heartwood	parallel lamination	splits and checks
core	hole	parallel-strand lumber (PSL)	sticker
cross-band	honeycombing	particleboard	tension bridging
decay	I-joist	phloem	thermoplastic
deciduous	kiln dried	photosynthesis	thermoset adhesive
defect	knot	pitch pocket	tracheid
edge-grained	laminated strand lumber		urea-formaldehyde resin



Chapter-Opening Material

Pro Tip

If you will be using your cordless tool for more than a few minutes, throw a spare battery in the charger, even if you think it is already charged. Today's batteries and chargers regulate so they will not overcharge. It does them no harm to be put on the charger twice. You do not want to be caught off guard with no battery power to work with.

Code Note

Section R406 of the IRC specifies the conditions that require either dampproofing or waterproofing. Any concrete or masonry foundation walls "that retain earth and enclose interior spaces and floors below *grade* shall be dampproofed from the finished grade to the top of the footing or 6" below the top of the basement floor." The IRC then provides a list of the permissible materials, which include continuous coating and acrylic-modified cement. Waterproofing is only required by "in areas where a high water table or other severe soil-water conditions are to exist."

Green Note

The thermal envelope is unwanted air leakage in building to conserve energy. Advanced framing techniques (AFTs) minimize waste by eliminating redundant lumber use without weakening the structure. Since heat escapes faster through wood than insulation, using less lumber and more insulation strengthens the building's thermal envelope.

Safety Note

The hazards associated with carpentry require that you develop a good attitude toward safety. This means that you must be willing to spend time learning the safest way to do your work. You must be willing to follow safety rules and regulations at all times.

Construction Careers
Framing Carpenter

Most of the carpenters employed in residential and light commercial construction are framing carpenters. They are sometimes referred to as rough carpenters to distinguish them from the finish carpenters who do trim and specialty work. Framing carpenters primarily work with wood as floor structures, building. In recent years, the increasing use of light steel framing, especially in

with more experienced carpenters. Others enter the field from vocational school programs or take part in formal apprenticeship training. A carpentry apprenticeship typically is 3–4 years in length and combines classroom training with practical experience and instruction on the jobsite. Because they are exposed to most aspects of the construction process, carpenters who work for general contracting firms have opportunities for advancement to positions such as foreman, carpentry supervisor, or general construction supervisor.

PROCEDURE

Using Anchor Bolts

1. Remove the washers and nuts.
2. Lay the sill along the foundation wall.
3. Using a square, draw lines across the sill on each side of the bolts, as shown in **Figure 10-21**.
4. Measure the distance from the center of the bolt to the outside of the foundation. If the sheathing or brick veneer is to be flush with the foundation, subtract the thickness of the sheathing or the brick veneer.
5. Use a hole saw to drill the bolt holes. You will probably need to make one hole for each anchor bolt.

are self-employed. They work for residential contractors, commercial contractors, and other housing contractors. They work in firms that build residential structures. They have the ability to read and interpret blueprints. They must be able to use tools efficiently and accurately. Their work is often done outdoors, often in rainy, dusty, cold, or hot weather conditions. Wearing appropriate clothing and proper personal protective equipment is important.

Framing carpenters acquire their skills in a variety of ways. Many learn through informal on-the-job training

Workplace Skills

Work Ethic

Having a good work ethic means you are punctual, dependable, and responsible on the job. Employers want their employees to be capable of taking initiative and working independently. Taking initiative means that you start activities on your own without being told. When you finish one task, you do not wait to hear what to do next. Individuals who take initiative need much less supervision. They have self-motivation, or an inner drive to perform well. Generally, this motivation will help you to set goals and accomplish them. All these qualities together show that you are capable of working independently. Other examples of a good work ethic include organization, accuracy, and efficiency.

Developing a strong work ethic starts with having a positive attitude and putting your best effort into any task. Work can be rewarding, engaging, and even fun. Not every day on the job will be awesome. Use the hard days as motivation; you can overcome the challenges and gain confidence in yourself. With the right attitude toward work, you will develop a strong work ethic.

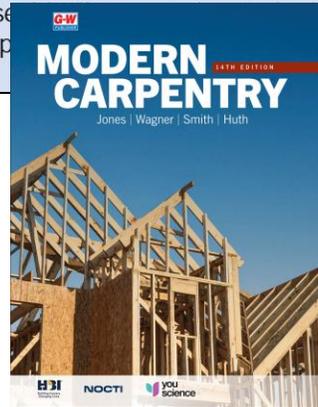


Figure 11-A. Framing carpenters work mostly with structural materials made of wood. They work on all sections of a building, from top to bottom. They are trained in the use of hand and power tools, as well as measuring devices.

Additional Features



- Metal framing materials, fabricated from thin steel, are widely used in commercial construction, but are sometimes used in residential construction. Steel joist hangers and other metal framing connectors improve joint strength in lumber construction. They are fastened together with screws or welded joints.
- Many different types of fasteners are used in construction for various applications.
- Various types of construction adhesives are used in construction. Specific instructions vary. Always follow manufacturers' recommendations.

Know and Understand

Answer the following questions using the information in this chapter.

- Lumber includes all of the following building materials, *except* for _____.
 - flooring boards
 - steel frames
 - timber used for posts
 - wood sills and plates
- Wood fibers or cells are called _____.
 - tracheids
 - lignin
 - cambium
 - xylem
- True or False?* Annular rings make up the grain patterns seen on the surface of wood boards.
- True or False?* All hardwood trees produce wood that is harder than that of softwood trees.
- Which of the following species of wood is classified as hardwood?
 - Hemlock
 - Redwood
 - Willow
 - Douglas fir
- Hardwood lumber that is cut so the annular rings form an angle of more than 45° with the surface of the board is referred to as _____.
 - flat-grained
 - plain-sawed
 - edge-grained
 - quarter-sawed
- Wood reaches its fiber saturation point when the _____.
 - moisture content in the wood is the same as the moisture content in the air
 - moisture content in the wood has been reduced to 0%
 - cells of the wood are empty, but the cell walls are still full of moisture
 - wood has been kiln dried

Match the lumber defect description.

- Cavities that contain solid or liquid for
- Separations along grain and between annular growth rings
- Disintegration of fibers due to fungi
- Caused by an emb branch or limb.
- Any variation from or plane surface.
- Separations of the fibers that run along the grain and across annular growth rings
- Separation of the fibers inside
- Caused by a mold fungus.
- Openings caused by handling equipment or boring insects or worms.
- The presence of bl or the absence of bl along the edge of
- Lumber that is grain reversing
 - board
 - dimension
 - factory and shop
 - timber
- True or False?* Wh amount of lumber always be used.

- When using _____ to join parts, surfaces must never be allowed to touch before they are in perfect alignment, because bonding takes place immediately.
 - epoxy
 - polyurethane adhesive
 - contact cement
 - casein glue
- In the United States, Type III adhesives are rated as such due to their _____.
 - little or lack of resistance to water
 - ability to retain bond strength even if submerged in water indefinitely
 - ability to retain bond strength after being soaked in water for four hours and then dried for 19 hours at 120°F (50°C)
 - fast bonding time

Apply and Analyze

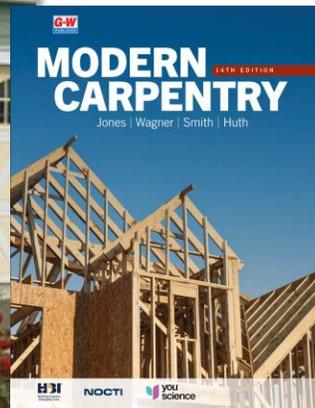
- In your own words, what is lumber?
- Describe how tree growth occurs.
- What applications are hardwoods best used for?
- What is the moisture content of a board if a test sample that originally weighed 11.5 oz was found to weigh 10 oz after oven drying?
- Explain the difference between a defect and a blemish in wood.
- What is the best available grade of hardwood lumber?
- Find the board feet contained in a stack of 24 pieces of 2" × 4" × 8'.
- What does the span rating of plywood indicate?
- What information is found on the end tag or stamp of pressure-treated lumber?
- Briefly describe the proper method of storing and handling the following building materials: framing lumber and sheathing, exterior finish materials, door frames, window units, and plywood.
- Briefly state the use for each of the following types of engineered lumber: laminated-veneer lumber (LVL), glue-laminated beams (glulams), parallel-strand lumber (PSL), and laminated-

Critical Thinking

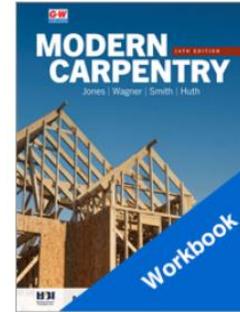
- Imagine you are visiting your uncle in his new home in Pennsylvania. The home was finished about three months ago and was built during a very wet spring. Your uncle remarks that he was amazed at how fast the contractor was able to build the home, even through the wet weather. The summer has been humid, but Pennsylvania winters are known for dry air. Heating the house will start to bring the framing lumber to its equilibrium moisture content. By your appraisal, what issues might your uncle come to find this winter?
- I-joists have some advantages over conventional framing lumber. However, in the event of a fire, I-joists are more susceptible to rapid loss of structural integrity. Conceptualize a method of protection that could extend the structural life of I-joists in the event of a fire. Justify your design as if you had to convince a code enforcement officer.

Communicating about Carpentry

- Reading and Speaking.** Create a collage that identifies different types of lumber and metal framing. Show examples of structures by researching pictures found in construction publications or websites. Show and discuss your collage in a group of four to five classmates. Are the other members of your group able to determine the types of lumber and framing that you tried to represent?
- Writing.** Write an essay describing the home or building you lived in while growing up. Be as specific as possible while trying to identify the different materials used in the construction of the building. Compare the home you grew up in with your dream house. Point out the differences, other than size, and include in your description the materials used and the design of both houses. Be detailed in your descriptions.
- Reading and Speaking.** Research some



End-of-chapter Content



Name:
Date:
Class:

Chapter 1: The Carpenter's Workplace

Carefully study the chapter and then answer the following questions.

1. The number of carpenters employed in the United States is expected to ____ over the next several years.
 - A. decrease
 - B. remain about the same
 - C. increase
 - D. vary

Answer:

2. Some of the highest-paying carpentry jobs are in ____.
 - A. residential construction
 - B. surveying
 - C. promoting of performing arts and sports
 - D. bricklaying

Answer:

3. *True or False?* All carpenters are expected to follow OSHA standards when on the job.

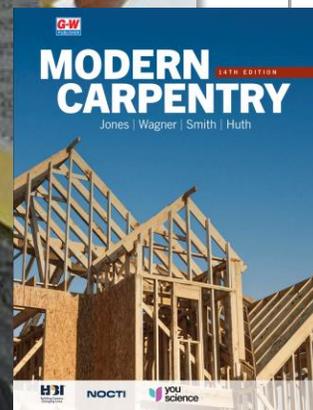
Answer:

4. The majority of carpenters work in ____.
 - A. remodeling, maintenance, and renovations
 - B. building construction
 - C. prefabrication of buildings
 - D. specialized carpentry fields

Answer:

Activities ▼

- 1 The Carpenter's Workplace
- 2 Safety
- 3 Building Materials
- 4 Hand Tools
- 5 Power Tools
- 6 Scaffolds, Ladders, and Rigging
- 7 Plans, Specifications, and Codes
- 8 Building Layout
- 9 Footings and Foundations
- 10 Floor Framing
- 11 Wall and Ceiling Framing



Lab Workbook



Modern Carpentry Virtual Toolbox



Activity Worksheets

Personal Protective Equipment

[Personal Protective Equipment Activity 1](#)

Fasteners

[Fasteners Activity 1](#)

Hand Tools

[Hand Tools Activity 1](#)

[Hand Tools Activity 2](#)

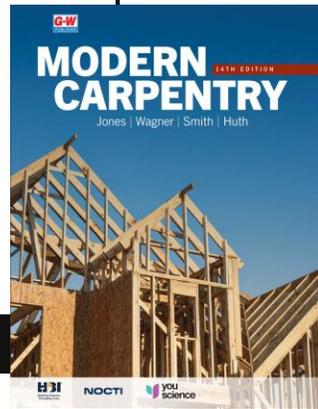
[Hand Tools Activity 3](#)

[Hand Tools Activity 4](#)

Concrete Foundation Tools E-Flash Cards



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Constructing Wall Frames



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Transcript

Constructing Wall Frames

Place the studs crown up at each position marked on the wall plates. Align the end of a stud with the appropriate line on the plate. Drive three framing nails through the plate and into the end of the stud. Repeat this on all other full studs. Then, align and nail the other ends of the studs to the other wall plate.



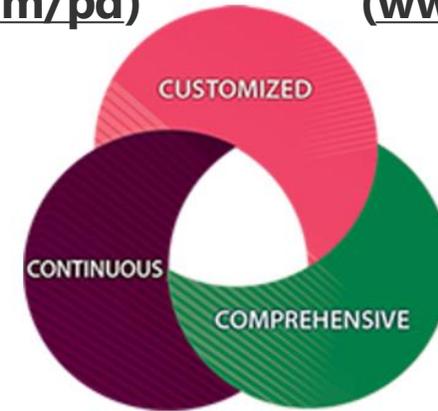
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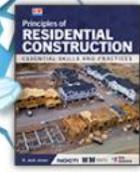
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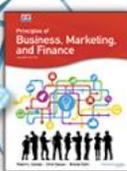
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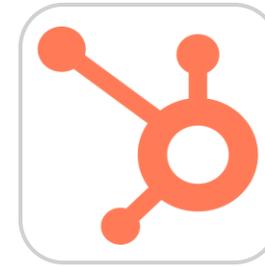


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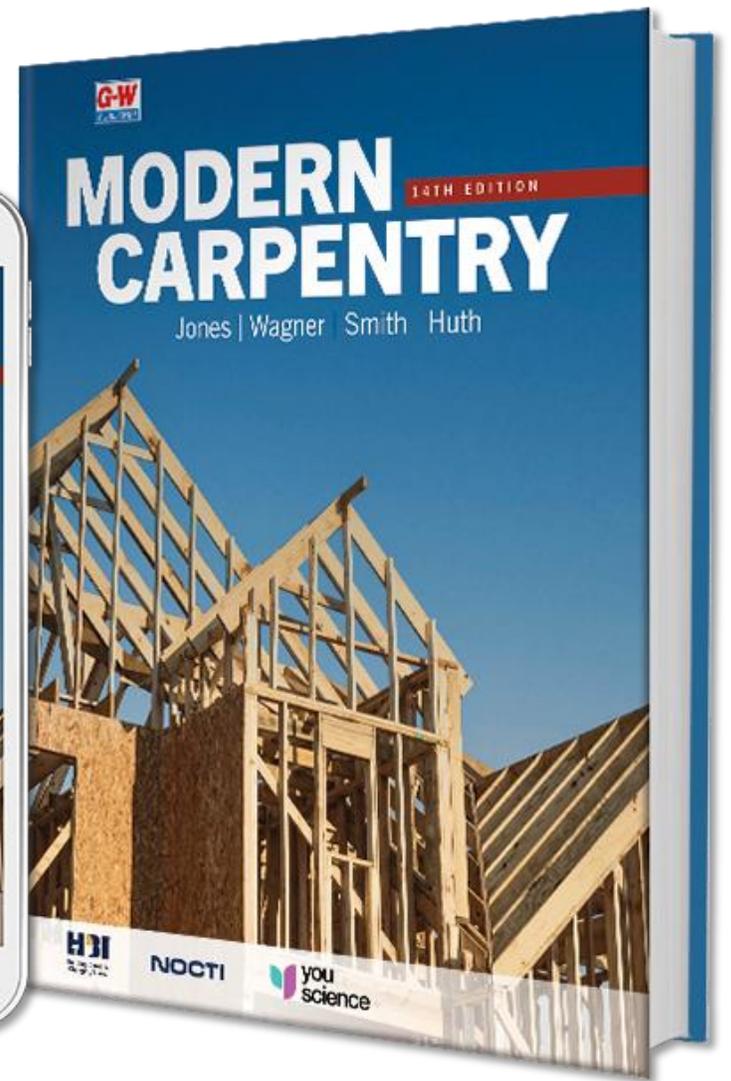
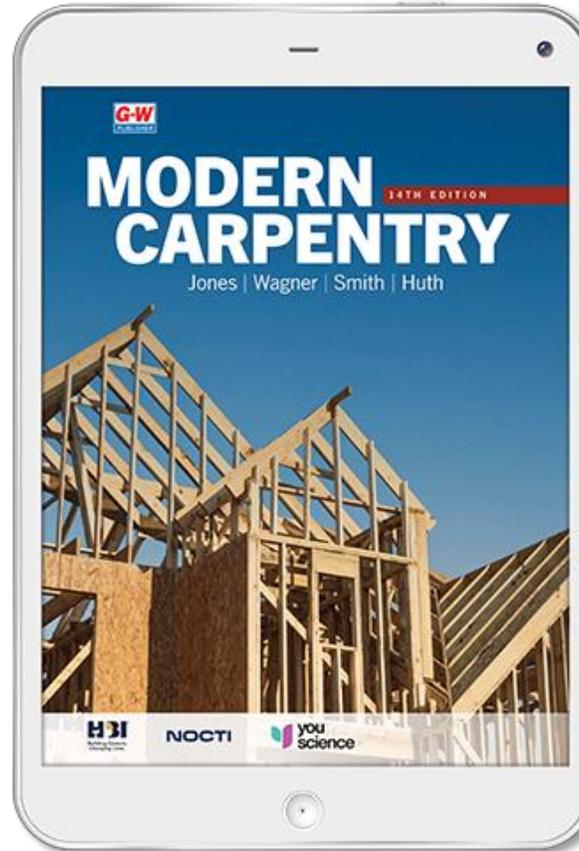
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