

LANDSCAPE

Design, Installation, and Management



Christopher D. Hart | R. Lee Ivy

Second Edition

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Preface

Landscape Design, Installation, and Management was created to meet the need for a comprehensive, modern, and visually exciting introduction to the study of the landscaping industry. *Landscape Design, Installation, and Management* provides learners with a breadth of knowledge of the green industry with a focus on landscaping while also creating awareness of careers and workplace skills needed to be successful. To help readers achieve these goals, the authors have incorporated supplemental activities, such as STEM connections, hands-on landscaping activities, and personalized career connections throughout the text.

The organization and content coverage of *Landscape Design, Installation, and Management* was developed with valuable insight from a panel of expert reviewers and with the certifications and skills associated with the National Association of Landscape Professionals at the forefront. The textbook content also correlates to various state standards and to exam standards for YouScience® Industry Certifications, as well as NOCTI Credentials. *Landscape Design, Installation, and Management* is presented in 22 chapters with three illustrated glossaries, which include many of the plants, tools, equipment, and pests that are often presented in the identification portion of landscape competitions.

The initial chapters concentrate on occupational safety, tools and equipment, career readiness, and personal skills that are valuable in both school and work environments. Chapter 1 provides an overview of the green industry with a focus on landscaping work and businesses. Chapter 2 covers personal and professional skills needed to succeed in today's business world. Chapters 3 and 4 review safety in the workplace and while working with the tools and equipment used in the industry. An illustrated glossary of nursery and landscape tools and equipment immediately follows Chapter 4.

Chapter 5 instructs students on proper site evaluation based on crucial factors such as water movement and soil analysis. It also emphasizes the importance of determining landscape use, identifying rules and regulations that may affect the design, and the level of maintenance desired by the client. Chapter 5 also covers the basics of choosing plants that will thrive in new landscapes. Chapter 6 explains the principles and elements of design and how students can incorporate these elements into their designs. Chapter 7 discusses the concept of the outdoor room and how to use plants and hardscape materials to create a landscape that meets the client's needs and desires.

Plant production for the nursery and landscape industry is covered in Chapter 8. Substrates, plant propagation, field and container production, and soil types are also included in this chapter. Chapter 9 covers taxonomy, basic biology, and plant growth and development. Readers will develop an understanding of basic plant biology as well as how environmental controls can be used to manipulate plant growth. Chapter 10 provides detailed descriptions of the types and forms of plants that are used in landscape design.

Chapter 11 provides full-color images and thorough descriptions of the common turfgrasses used to establish lawns, sports fields, and roadside erosion control. Chapter 12 covers new installations as well as turf repair and how to choose

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the proper turfgrass for different applications. Following chapters include lighting and water feature installation, hardscapes and basic installation procedures, and design practices used in landscape design.

Chapters 17, 18, and 19 focus on business start-ups, management, and establishing and maintaining positive client relationships. Basic accounting and business principles are included in Chapter 17 to help students understand the risks and advantages of owning their own business. Chapter 18 presents a methodical approach to pricing landscape projects so they are profitable and establishing and maintaining client relationships.

Chapters 20 and 21 explain proper methods for plant installation to ensure health and longevity and how to establish maintenance programs that make the best use of time and equipment to ensure a profit. The last chapter explains pest management through biological, chemical, mechanical, and cultural controls. Pest life cycles and the effect of controls at different stages is also explained in Chapter 22. Reading pesticide labels and using pesticides properly are explained in detail.

The study of these principles and embarking on a career in landscape design, installation, and management will be challenging and rewarding. We hope you enjoy the information presented and that it provides inspiration, information, and direction for your passion and pursuits.

Christopher D. Hart
R. Lee Ivy

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About the Authors

Christopher D. Hart

Christopher D. Hart teaches agriculture and horticulture classes for Chatham Central High School in Bear Creek, North Carolina. Mr. Hart's courses focus on hands-on learning and producing college- and career-ready students. Mr. Hart is an alum of North Carolina State University (NCSU) where he earned a Bachelor of Science in Horticultural Science and in Agricultural Business Management. Mr. Hart also earned a Master of Science in Agricultural Education from NCSU.

Mr. Hart and his students are responsible for maintaining the school's conservatory, community garden, and six-acre arboretum. Students are responsible for propagating, growing, and selling over 200 species of plants throughout the growing season.

In addition to advising the Chatham Central FFA Chapter, Mr. Hart has coached top-placing nursery landscape and floriculture teams in National FFA Career Development Events. He is the author of the lab workbook that accompanies *Horticulture Today* (Goodheart-Willcox Publisher). Mr. Hart is also a Certified Plant Professional and a Certified Pesticide Applicator.

R. Lee Ivy

R. Lee Ivy is the Director of the Agricultural Institute and Assistant Director of Academic Programs in the College of Agriculture and Life Sciences at North Carolina State University (NCSU) and has been a post-secondary educator since 2001. Childhood experiences with peaches, vegetables, cattle, and ornamental plants sparked his love of agriculture.

Mr. Ivy taught in the Department of Horticultural Science at NCSU in areas of fruit and vegetable production, ornamental and turf weed and disease management, landscape maintenance, landscape construction courses, introductory horticulture, and home horticulture via distance education. He served as co-advisor for the Horticulture Competition Team and co-hosted the National Collegiate Landscape Competition. Prior to his experience at NCSU, he taught at Sandhills Community College.

He holds degrees in horticulture from the University of Tennessee and NCSU, is a licensed landscape contractor, a member of the International Plant Propagators Society—Southern Region, a certified pesticide applicator, a certified plant professional, and a member of the North Carolina Nursery and Landscape Association. He is currently pursuing a doctoral degree in the Department of Agricultural and Extension Education focused on the implications of online and face-to-face education delivery methods.

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Reviewers

The authors and publisher wish to thank the following industry and teaching professionals for their valuable input into the development of *Landscape Design, Installation, and Management*.

Sara Bellaire
Fanshawe College
London, Ontario, Canada

Tim Closs
Naaman Forest High School
Garland, Texas

Mandy Curry
Central High School
Woodstock, Virginia

Joshua Day
Muscatine High School
Muscatine, Iowa

Travis Gonzales
Brenham ISD
Brenham, Texas

David Gossman
Atwater High School
Atwater, California

Brittney Kee
Chicago High School for Agricultural Sciences
Chicago, Illinois

John Kreitzer
Upper Valley Career Center
Piqua, Ohio

Mike Liston
Tolles Career and Technical Center
Plain City, Ohio

Joe Luther
Central PA Institute of Science & Technology
Pleasant Gap, Pennsylvania

Mandi Millen
Cazenovia Central High School
Cazenovia, New York

Aaron Nering
Perris High School
Perris, California

Caela Paioff
Colonial High School
Orlando, Florida

Joe Ramey
Central Nine Career Center
Greenwood, Indiana

Jodi Riedel
North Carolina State University
Raleigh, North Carolina

Brandon K. Sollars
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New to This Edition

The new edition of *Landscape Design, Installation, and Management* features new and revised end-of-chapter questions and activities, including critical thinking questions; reading, writing, and speaking activities; and math, science, and academic activities. There are also student project ideas in each end-of-chapter section. Other new text components include the following:

- New and revised Career Connection interviews with professionals from all areas of the industry
- Updated industry statistics
- Additional Hands-On Landscaping features
- For digital users, the Landscape and Horticulture Virtual Toolbox contains hundreds of floriculture-, horticulture-, and landscaping-related images that are used in e-flash cards and other identification activities

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Credentialing Partners and Support

Goodheart-Willcox appreciates the value of industry credentials, certifications, and accreditation. *Landscape Design, Installation, and Management* is correlated to the *Horticulture-Landscaping* credential offered by NOCTI, the YouScience® Industry Certification *133 Landscape Management*, and is a National Association of Landscape Professionals Classroom Resource.

National Association of Landscape Professionals

Goodheart-Willcox is pleased to partner with The National Association of Landscape Professionals (NALP), a national trade association representing an industry of approximately 1.2 million landscape, lawn care, irrigation, and tree care professionals. NALP offers its members professional development through education, networking, and mentoring opportunities. The association also develops and manages national training, certification, accreditation, and certificate programs. Member companies specialize in lawn care, landscape design and installation, landscape maintenance, tree care, irrigation and water management, and interior plantscaping. Members also include students, consultants, industry suppliers, state associations and affiliate members. Membership for students and educators is free. For more information about NALP, visit www.landscapeprofessionals.org.

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Goodheart-Willcox is pleased to partner with NOCTI, a leading provider of industry certification solutions for CTE programs across the nation. With over 50 years of experience, NOCTI is a valuable partner in the CTE community's efforts to improve America's workforce. Goodheart-Willcox has created correlations between select products and the standards and competencies that make up the NOCTI credentials, to the benefit of states, instructors, and students working to achieve NOCTI credentials.

NOCTI certifications (knowledge-based and skill-based) are developed by national teams of subject matter experts as part of the process that meets personnel accrediting standards and requirements under ISO 17.024, resulting in credentials measuring skills and competencies critical for learner success outside the classroom. From online test delivery and psychometric services to digital badging and professional development, NOCTI uses the latest tools and methods to provide relevant solutions for those in CTE. For more information about NOCTI, visit www.nocti.org.

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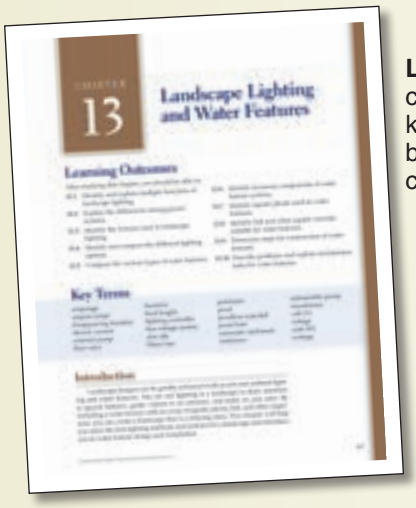
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To see how Landscape Design, Installation, and Management correlates to credentialing and certification standards, visit the Correlations tab at https://www.g-w.com/landscaping-design-installation-management-2025.

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Features of the Textbook

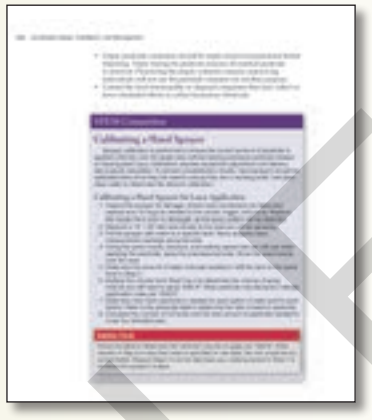
The instructional design includes student-focused learning tools to help students succeed. This visual guide highlights the features designed for the textbook.



Learning Outcomes clearly identify the knowledge and skills to be obtained when the chapter is completed.

Key Terms list the key terms to be learned in the chapter.

Introduction provides an overview and preview of the chapter content.



Safety First notes alert you to potentially dangerous materials and practices.



STEM Connection features integrate all four components of STEM education as well as the social sciences and language arts.

Career Connection features introduce students to careers in different fields of the green industry and include critical thinking questions for discussion.

Living Green notes highlight key items related to sustainability, energy efficiency, and environmental issues.







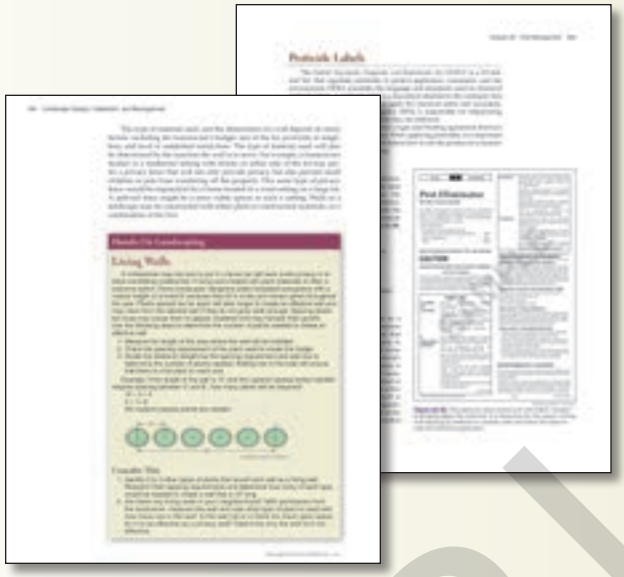
Workplace Readiness Skills help prepare students with professional traits that are necessary to maintain employment.



Pro Tips provide you with advice and guidance that is especially applicable for on-the-job.

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Hands-On Landscaping features are highlighted throughout the textbook to provide clear instructions for hands-on service activities.



Illustrations have been designed to clearly communicate the specific topic.

Apply and Analyze questions extend learning and develop your abilities to use learned material in new situations and to break down material into its component parts.

Summary feature provides an additional review tool for you and reinforces key learning outcomes.



Critical Thinking questions help you develop higher-order thinking and problem-solving, personal, and workplace skills.

Suggested Activities include plausible individual and group activities in which you can apply your knowledge and use methods covered throughout the textbook.

Chapter Review questions allow you to demonstrate knowledge, identification, and comprehension of lesson material.



Illustrated Glossaries include full-color images of many of the shrubs, trees, perennials, and annuals commonly used in landscape designs and in the identification portion of landscaping competitions.

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TOOLS FOR STUDENT AND INSTRUCTOR SUCCESS

Student Tools

Student Text

The *Landscape Design, Installation, and Management* textbook provides an exciting, full-color, and highly illustrated learning resource in print and online. The textbook introduces the hands-on skills and theory required to begin a career in the green industry and serves as a resource for various student competitions.



Workbook

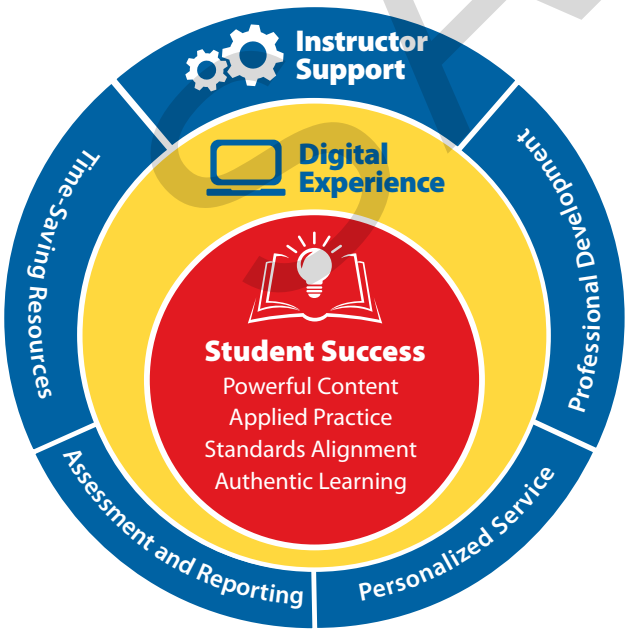
- Hands-on practice includes questions and activities.
- Organized to follow the textbook lessons to help students achieve key learning outcomes.

G-W Digital Companion

- E-flash cards and vocabulary exercises allow interaction with content to create opportunities to increase achievement.
- Labeling activities offer students opportunities to practice identifying plants and tools used in the industry.

Online Learning Suite

- Provides easy-to-use access and navigation
- Includes accessible resources for all learners
- Encourages exploration and discovery (or practice and repetition)
- Landscape and Horticulture Virtual Toolbox contains hundreds of floriculture-, horticulture-, and landscaping-related images



Instructor Tools

LMS Integration

Integrate Goodheart-Willcox content within your Learning Management System for a seamless user experience for both you and your students. EduHub LMS–ready content in Common Cartridge® format facilitates single sign-on integration and gives you control of student enrollment and data. With a Common Cartridge integration, you can access the LMS features and tools you are accustomed to using and G-W course resources in one convenient location—your LMS.

G-W Common Cartridge provides a complete learning package for you and your students. The included digital resources help your students remain engaged and learn effectively:

- **Digital Textbook**
- Online **Lab Workbook content**
- **Drill and Practice** vocabulary activities
- Landscape and Horticulture **Virtual Toolbox**

When you incorporate G-W content into your courses via Common Cartridge, you have the flexibility to customize and structure the content to meet the educational needs of your students. You may also choose to add your own content to the course.

For instructors, the Common Cartridge includes the Online Instructor Resources. QTI® question banks are available within the Online Instructor Resources for import into your LMS. These prebuilt assessments help you measure student knowledge and track results in your LMS gradebook. Questions and tests can be customized to meet your assessment needs.

Online Instructor Resources

- The **Instructor Resources** provide instructors with time-saving preparation tools such as answer keys, editable lesson plans, and other teaching aids.
- **Instructor's Presentations for PowerPoint®** are fully customizable, richly illustrated slides that help you teach and visually reinforce the key concepts from each chapter.
- Administer and manage assessments to meet your classroom needs using **Assessment Software with Question Banks**, which include hundreds of matching, completion, multiple choice, and short answer questions to assess student knowledge of the content in each chapter.

See https://www.g-w.com/landscaping-design-installation-management-2025 for a list of all available resources.

Professional Development

- Expert content specialists
- Research-based pedagogy and instructional practices
- Options for virtual and in-person Professional Development

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R. Lee Ivy