CTECS Landscaping Design, Installation, and Equipment Curriculum

CTECS
CONNECTICUT
TECHNICAL EDUCATION
AND CAREER SYSTEM

Table of Contents

CTECS - Vision of a Graduate

Connecticut Technical Education and Career System
Vision of a Graduate

A CTECS Graduate is…

A Problem Solver

Respectful

A Critical Thinker

Work Ready

Skilled Socially

An Effective Communicator

The Vision of a Graduate (VoG) at the Connecticut Technical Education and Career System (CTECS) embodies our commitment to preparing students for success in Connecticut's workforce. Developed in collaboration with students, parents, staff, and employers, the VoG ensures that CTECS students are not only job-ready but also equipped to lead, innovate, and adapt in a dynamic world. As educators, we are dedicated to developing these qualities by providing a comprehensive education that empowers our students to achieve their fullest potential and make meaningful contributions to society.

A Problem Solver	Work Ready
Problem solvers tackle challenges by identifying root causes of issues, brainstorming solutions, implementing effective strategies, and demonstrating adaptability. ➔ Engage students with open-ended, creative thinking tasks that require both conventional and innovative solutions. ➔ Facilitate group discussions and collaborative projects. ➔ Use real-world scenarios and hands-on activities. ➔ Highlight the importance of effort, persistence, and continuous learning. ➔ Provide regular feedback and encourage reflection.	*To be work-ready includes a combination of technical expertise, soft skills, and personal qualities that ensure a graduate can effectively contribute to the workplace from day one.* ➔ Set high standards for punctuality, responsibility, professionalism, and task completion. ➔ Use project-based learning and collaborative assignments. ➔ Emphasize clear written and verbal communication. ➔ Offer practical exercises like mock interviews and resume workshops. ➔ Integrate technology and teach digital literacy.

Respectful

Graduates who embody respectfulness emphasize the importance of treating others with dignity, valuing diversity, and fostering an inclusive and positive environment, both personally and professionally.

- ➔ Demonstrate personal, interpersonal, and professional skills.
- ➔ Show respect for diversity.
- ➔ Model respect through active listening and empathy.
- ➔ Set clear expectations for respectful interactions.
- ➔ Promote collaboration and group discussions.
- ➔ Celebrate respectful behavior.
- ➔ Address disrespect promptly and constructively.

Skilled Socially

Graduates who are skilled socially are equipped to navigate social environments, build relationships, and contribute positively to their communities and workplaces.

- ➔ Show awareness of global responsibility to others and the environment.
- ➔ Participate in community involvement.
- ➔ Design cooperative group projects and team activities
- ➔ Set expectations for respect and give regular feedback.
- ➔ Facilitate discussions on inclusivity, kindness, and respect.
- ➔ Model positive interactions and recognize strong social skills.

A Critical Thinker

Critical thinkers approach problems systematically by analyzing, evaluating, and synthesizing information to make well-informed decisions and contribute to innovative solutions.

- ➔ Encourage critical thinking individually and collaboratively.
- ➔ Design lessons that challenge assumptions and explore diverse viewpoints.
- ➔ Use open-ended questions, rigorous activities, and cross-curricular projects.
- ➔ Integrate project-based learning and real-world problem-solving.
- ➔ Offer reflective opportunities like journaling and discussions.
- ➔ Cultivate an environment that values curiosity and inquiry.

An Effective Communicator

Effective communicators convey ideas, information, and emotions accurately and persuasively, fostering understanding and collaboration.

- ➔ Communicate effectively using oral, written, visual, artistic, and technical modes.
- ➔ Include group discussions, presentations, and peer reviews.
- ➔ Promote active listening and thoughtful responses.
- ➔ Offer clear guidelines and constructive feedback.
- ➔ Stress clear, respectful, and purposeful communication.

CTECS Instructional Model

CTECS uses the Marzano Compendium to guide research-based instructional strategies that differentiate learning and promote access, engagement, and success for all students. Teachers apply these strategies to support diverse learners (including multilingual learners, students with disabilities, and students with varied academic or technical backgrounds) through scaffolds, modeling, guided practice, and multiple ways to participate and show understanding. This approach ensures every student can work toward proficiency in the Priority Standards and the competencies outlined in the CTECS Vision of a Graduate.

Marzano Compendium

Feedback

Providing and Communicating Clear Learning Goals

1. Providing scales and rubrics
2. Tracking student progress
3. Celebrating success

Using Assessments

4. Using informal assessments of the whole class
5. Using formal assessments of individual students

Content

Conducting Direct Instruction Lessons

6. Chunking content
7. Processing content
8. Recording and representing content

Conducting Practicing and Deepening Lessons

9. Using structured practice sessions
10. Examining similarities and differences
11. Examining errors in reasoning

Conducting Knowledge Application Lessons

12. Engaging students in cognitively complex tasks
13. Providing resources and guidance
14. Generating and defending claims

Using Strategies That Appear in All Types of Lessons

15. Previewing strategies
16. Highlighting critical information
17. Reviewing content
18. Revising knowledge
19. Reflecting on learning
20. Assigning purposeful homework
21. Elaborating on information
22. Organizing students to interact

Context

Using Engagement Strategies

23. Noticing and reacting when students are not engaged
24. Increasing response rates
25. Using physical movement
26. Maintaining a lively pace
27. Demonstrating intensity and enthusiasm
28. Presenting unusual information
29. Using friendly controversy
30. Using academic games
31. Providing opportunities for students to talk about themselves
32. Motivating and inspiring students

Implementing Rules and Procedures

33. Establishing rules and procedures
34. Organizing the physical layout of the classroom
35. Demonstrating withitness
36. Acknowledging adherence to rules and procedures
37. Acknowledging lack of adherence to rules and procedures

Building Relationships

38. Using verbal and nonverbal behaviors that indicate affection for students
39. Understanding students' backgrounds and interests
40. Displaying objectivity and control

Communicating High Expectations

41. Demonstrating value and respect for reluctant learners
42. Asking in-depth questions of reluctant learners
43. Probing incorrect answers with reluctant learner

Curriculum Introduction

This curriculum document outlines the essential learning for this trade program and provides a clear structure for planning, instruction, and assessment. It includes the components required by NEASC Standard 2.2a, along with elements that reflect the unique nature of CTECS technical programs. The curriculum is organized to show what students learn in each course, how learning progresses across grade levels, and how instruction supports both technical skill development and the CTECS Vision of a Graduate.

Teachers should use this document to:

- Understand the overall structure and expectations of the course sequence
- Reference the Course Map to see the scope and sequence of Priority Standards and the alignment to District Summative Assessments (DSAs)
- Use the Priority Standards and Units of Study to guide daily, weekly, and cycle-based planning
- Integrate Big Ideas, Essential Questions, Skills/Learning Outcomes, vocabulary, and resources during lesson design
- Identify required safety, industry, and technical content expectations
- Plan and implement formative assessments to monitor progress and guide instruction
- Prepare students for the District Summative Assessments, ensuring alignment with the Course Map
- Maintain consistency of technical and professional practice instruction across campuses while adapting to student needs and industry-based opportunities

Curriculum Components

Course Map

A Course Map serves as the scope and sequence for this course by outlining the progression of instructional units and the standards that guide teaching and assessment. While each campus will have individual student needs, cycle schedules, and industry-based opportunities, all instructors are expected to teach the standards outlined in the Course Map. Using the Course Map below, teachers will intentionally plan learning experiences that prepare students to meet the identified standards within the designated assessment windows.

Priority Standards (Units of Study)

Priority Standards identify the most essential learning in the trade program. They reflect the core technical competencies, safety practices, and industry-aligned skills that require the greatest instructional focus and appear on program assessments. In CTE programs, each Priority Standard also functions as a Unit of Study, because it includes the required components such as big ideas, essential questions, content topics, and skills/learning outcomes aligned to assessments.

Vertical Alignment

Vertical alignment shows how Priority Standards and instructional expectations progress from grade to grade within the trade program. It provides a clear pathway of skill development, increasing complexity, and technical proficiency across the four-year sequence.

Learning Outcomes

Learning outcomes are what students will know (Concepts) and be able to do (Skills). Concepts identify the major content topics within the Priority Standard (Unit of Study). They appear in the left column of the Learning Outcomes table and follow a similar coding structure as the Priority Standard.

Skills are learning objectives that describe the measurable actions students must be able to perform to demonstrate proficiency. They appear in the right column of the Learning Outcomes table and show the progression of learning evidence in the Priority Standard.

Vocabulary

Essential vocabulary includes the technical and academic terms students must understand and use accurately to engage in trade-specific learning and demonstrate proficiency on assessments. Vocabulary is foundational to safety, technical precision, and industry communication, and should be a primary initial focus within each unit and taught explicitly through modeling, demonstration, and repeated application.

Resources

Resources include the tools, equipment, texts, materials, and digital tools that support learning within each unit and reflect industry standards.

Assessment Practices

Teachers use ongoing formative assessments—such as questioning, checks for understanding, performance demonstrations, reflections, and teacher observation—to monitor progress, guide instruction, and support all learners in mastering the Priority Standards.

Each program also includes District Summative Assessments (DSAs), which measure proficiency on the Priority Standards identified in the Course Map. DSAs provide consistent evidence of student learning across campuses and ensure alignment to industry expectations, safety requirements, and program outcomes. Teachers should reference the Course Map and Units of Study when planning instruction to ensure students have opportunities to practice and demonstrate the skills and knowledge assessed on the DSA.

LDIE Philosophy

The LDIE course of studies is designed to create an appreciation of the industry and to develop entry level skills within the landscaping construction trade. Opportunities to develop skills for personal use and to make a successful transition from school to the workplace, or post-secondary institutions, will be presented to students enrolled in this course.

The LDIE course is designed to provide relevant industry- related theory content within the trade. Practical experience will be gained within the school, through outside production experience, and through optional Work Based Learning experiences by being employed by a competent landscaping construction contractor.

LDIE – Course Map

Grade 9 – Semester 1 & 2 DSA

- 9.1 Shop/Site Safety
- 9.2 Career Readiness
- 9.3 Measurement and Math I
- 9.4 Drawing, Sketching, and Introductory Design
- 9.5 Grading and Layout
- 9.6 Plants I: Foundations of Plant Science and Maintenance
- 9.7 Introduction to Hardscapes
- 9.8 Professional Practice in Landscaping

Grade 10 – Semester 1 DSA

- 10.1 Shop/Site Safety
- 10.2 Power Tools
- 10.3 Measurement and Math II
- 10.4 Hardscapes Design and Blueprint Reading
- 10.5 Surveying, Grading, and Layout
- 10.10 Professional Practice in Landscaping

Grade 10 – Semester 2 DSA

- 10.6 Plants II: Health, Pests, and Seasonal Maintenance
- 10.7 Hardscape Installation
- 10.8 Soil Prep and Drainage
- 10.9 Intro to Small Engine Repair
- 10.10 Professional Practice in Landscaping

Grade 11 – Semester 1 DSA

- 11.1 Jobsite Safety
- 11.2 Small Power Equipment
- 11.3 Measurement and Math III
- 11.4 Greenscape Design and Planting Plans
- 11.5 Soil Science
- 11.10 Professional Practice in Landscaping

Grade 11 – Semester 2 DSA

- 11.6 Plants III: Plant Science & System Design
- 11.7 Turf Management
- 11.8 Disease, Weeds, and Pesticides
- 11.9 Advanced Small Engine Repair
- 11.10 Professional Practice in Landscaping

Grade 12 – Semester 1 DSA

- 12.1 Jobsite Safety
- 12.2 Large Power Equipment
- 12.3 Measurement and Math IV
- 12.4 Advanced Landscape Design and Drawings
- 12.5 Project Management
- 12.9 Professional Practice in Landscaping

Grade 12 – Semester 2 DSA

- 12.1 Jobsite Safety
- 12.6 Irrigation
- 12.7 Plants IV: Design, Production & Advanced Applications
- 12.8 Greenhouse Growing
- 12.9 Professional Practice in Landscaping

*** See District Summative Assessment (DSA) exam outline for specific breakdown by substandard and learning objectives.**

9th Grade Curriculum

Priority Standard 9.1 - Shop/Site Safety

Big Idea(s):

- Safety begins with personal responsibility and awareness of surroundings
- Rules, procedures, and PPE are essential to prevent accidents in shop and site settings

Essential Question(s):

- How can hazard awareness prevent accidents?
- What are the most common safety hazards in shop and site settings?
- How can you protect yourself and others through proper behavior and PPE?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.1.1 Personal and Environmental Safety	• **Identify general hazards in shop and outdoor site settings** • **Describe safe behaviors in shared workspaces** • **Explain proper cleanup and tool storage procedures** • **100% on written safety test**
9.1.2 PPE and Emergency Protocols	• **Identify required PPE (gloves, safety glasses, hearing protection, boots)** • **Demonstrate safe dressing for work (no loose clothing, proper footwear)** • **Identify fire extinguisher types, eyewash stations, and first aid kit locations** • **100% on written safety test**
9.1.3 Hand and Power Tool Safety	• **Understand basic risks of hand tools and introductory portable power tools** • **Identify the correct purpose and associated hazards for each tool before use** • **Demonstrate safe handling, storage, and transport of tools]** • **Perform a safety inspection on tools before use** • **100% on written safety test**

Technical Vocab-

Personal Protective Equipment (PPE), Safety Glasses, Ear Protection, Fire Extinguisher, First Aid Kit, Eyewash Station, Hazard, Slip/Trip Hazard, Shop Rules, Housekeeping, Tool Storage, Risk Prevention, Safety Agreement

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 9.2 - Career Readiness

Big Idea:
Employability skills are just as important, if not more, than technical skills.

Essential Question(s):

- Why are personal and professional skills needed to be successful in LDIE?
- How can employability skills help to increase the likelihood of success?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.2.1 Job Opportunities ○ **Skills needed** ○ **Current job trends** ○ **Career opportunities**	● **Research job opportunities in LDIE** ● **Identify job requirements for entry-level employment in landscaping**
9.2.2 Employability Skills (CTECS VoG) ○ **Readiness** ○ **Importance of employability skills** ○ **Reliability**	● **Explain the importance of shop rules** ● **Demonstrate Professionalism** ○ **Dress code** ○ **Readiness** ○ **Hygiene**

Technical Vocab-

Professionalism, Organization, Critical thinking, communication skills, motivation, team work, hygiene

Resources-

https://www.realityworks.com, CTECS Vision of a Graduat

Priority Standard 9.3 - Measurement & Math I

Big Idea(s):

- Accurate measurement is essential in landscaping and construction
- Units and conversions form the foundation for applied problem-solving
- Geometry helps shape functional and aesthetic designs

Essential Question(s):

- How do I choose the right tool and unit for a measurement?
- How does geometry relate to landscaping layouts?
- Why is precision important in estimating materials?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.3.1 Measuring Tools and Units	• **Identify standard tools for measuring length and angles** • **Convert between inches, feet,** yards, and metric equivalents • **Demonstrate accurate measurements using tapes, rulers, and levels**
9.3.2 Introduction to Area & Perimeter	• **Calculate perimeter of simple shapes: square, rectangle, triangle** • **Calculate area for turf, mulch, or stone coverage needs** • **Solve basic layout problems using shape dimensions**

Technical Vocab-

Measurement, inch, foot, yard, meter, ruler, tape measure, perimeter, area, length, width, height, square footage

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 9.4 - Drawing, Sketching, and Introductory Design

Big Idea(s):

- Visual representation is critical for communicating landscape ideas
- Accurate drawings support the planning and layout of landscapes
- Sketching by hand builds foundational design skills and spatial reasoning
- Scaled drawings allow for proper material estimation and site layout

Essential Question(s):

- How does sketching help communicate design ideas?
- What role does scale play in technical drawings?
- How can basic drawing tools be used to communicate landscape layouts?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.4.1 Hand Sketching and Visual Communication	• **Identify common drawing tools and demonstrate their use** • **Create freehand sketches of landscape concepts** • **Label design sketches using basic symbols and terminology**
9.4.2 Types of Views and Scale	• **Differentiate between plan, elevation, and section views** • **Create drawings using each view type to represent a landscape** • **Convert measurements and apply appropriate drawing scales**
9.4.3 Symbols, Line Types, and Notation	• **Identify and correctly use standard landscape drawing symbols** • **Apply line types (e.g., hidden, center, object) in sketches** • **Interpret legend keys and drawing notation in sample plans**

Technical Vocab-

Plan view, elevation view, section view, sketch, scale, symbol, legend, object line, hidden line, center line, drawing tools

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 9.5 - Grade and Layout

Big Idea(s):

- Grading and layout are essential site preparation steps in landscape construction
- Accuracy in layout prevents costly installation mistakes
- Basic site geometry supports the placement of landscape elements

Essential Question(s):

- How do we use layout tools to accurately place features on a site?
- What techniques are used to establish proper grade?
- Why is site layout important before construction begins?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.5.1 Basic Site Grading Principles	• **Define grade, slope, and drainage.** • **Use slope stakes or laser levels to identify and set elevation changes** • **Calculate slope ratios and percentage grades from field data**
9.5.2. Site Layout Tools and Techniques	• **Demonstrate use of tape measures, strings, batter boards, and levels** • **Layout features using the 3-4-5 triangle method and other squaring techniques** • **Transfer blueprint dimensions to physical site layout**

Technical Vocab-

Grade, slope, layout, batter board, laser level, slope stake, transit, percent grade, layout string, squaring

Resources-

Landscape Design, Installation, and Management (GW).

Priority Standard 9.6 - Plants I: Foundations of Plant Science and Maintenance

Big Idea(s):

- Understanding plant biology supports healthy landscapes
- Identifying common plants helps in design and maintenance
- Proper planting and basic care techniques are foundational

Essential Question(s):

- How do plant structures and functions impact plant use in landscaping?
- What factors affect healthy plant growth?
- Why is identification important in landscape planning?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.6.1 Introduction to Plant Biology	• **Identify major parts of a plant and describe their functions** • **Create labeled diagrams of plant structures** • **Explain how plant parts work together to support growth**
9.6.2 Plant Identification & Classification	• **Identify common landscape plants (shrubs, trees, herbaceous)** • **Classify plants by key characteristics (deciduous vs. evergreen, annual vs. perennial)** • **Describe basic principles of plant taxonomy**
9.6.3 Growth & Propagation	• **Describe stages of plant growth (germination, maturity, reproduction)** • **Identify environmental factors that influence plant development** • Demonstrate propagation techniques: seeding, cutting, grafting
9.6.4 Planting & Maintenance Basics	• **Demonstrate proper planting depth and spacing techniques** • **Apply basic mulching and watering methods** • **Identify signs of pests and diseases** • **Use safe and effective pruning tools and techniques**

Students will know:	*As evidenced by: (oral, written, or performance)*
	• **Develop a basic care plan for a selected plant**

Technical Vocab-

Photosynthesis, xeriscaping, fertilization, mulch, pruning, botany, propagation, transplanting, cultivator, deciduous, evergreen

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 9.7 - Introduction to Hardscapes

Big Idea(s):

- Hardscaping plays a key role in both the function and aesthetics of a landscape
- Understanding the properties, uses, and limitations of various hardscape materials is essential for planning effective designs
- Safety is a critical component when working with tools and materials in hardscape settings.
- Entry-level knowledge of tools, materials, and planning processes provides a foundation for future hardscape work

Essential Question(s):

- What role does hardscaping play in overall landscape design?
- How do different hardscape materials compare in terms of appearance, durability, and sustainability?
- Why is safety essential when selecting and working with hardscape materials and tools?
- How can thoughtful planning and material selection impact a hardscape project's success?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.7.1 Overview of Hardscaping	• **Define the term hardscaping and distinguish it from greenscaping** • **Explain the purpose and importance of hardscapes in landscape design** • **Identify common types of hardscapes (e.g., patios, walkways, retaining walls)** • **Recognize the value of aesthetics, function, and durability in hardscape features**
9.7.2 Hardscape Materials	• **Identify key hardscape materials (e.g., stone, brick, pavers, wood, concrete)** • **Compare materials based on properties such as durability, permeability, cost, and environmental impact** • **Evaluate advantages and limitations of various materials for different site conditions** • **Describe basic treatment or maintenance considerations for each**

Students will know:	*As evidenced by: (oral, written, or performance)*
	material type (e.g., wood preservation, sealing concrete)
9.7.3 Tools and Safety in Hardscaping	• **Identify and describe common tools used in basic hardscaping** • **Explain and demonstrate general safety procedures when working with tools and materials** • **Match appropriate tools to specific materials and tasks (e.g., cutting pavers vs. mixing concrete)** • **Understand the importance of PPE (personal protective equipment) and situational awareness**
9.7.4 Basic Installation Practices	• **Describe the basic steps in preparing a site for hardscape installation (e.g., clearing, compacting, leveling)** • **Demonstrate proper layout techniques using simple measuring and marking tools** • **Identify the layers of a typical hardscape base (subbase, base material, setting bed)** • **Recognize the purpose of edge restraints and joint materials (e.g., joint sand, landscape edging)** • **Practice basic placement of materials**

Technical Vocab-

Hardscaping, greenscaping, paver, brick, concrete, quarrying, sustainability, erosion, slope stabilization, aesthetics, aggregate, lime, cement, geotextile, permeable, wood treatment, subbase

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 9.8 - Professional Practice in Landscaping

Big Idea(s):

- Professional and technical skills are demonstrated through the process and product of hands-on landscaping work
- Landscape design and installation projects provide opportunities to apply core competencies in real-world outdoor environments
- Employability attributes such as communication, problem-solving, and professionalism are critical to success in the green industry
- Reflection and portfolio documentation are essential for tracking growth and preparing for career opportunities

Essential Question(s):

- How do professional behaviors and employability skills impact success in landscaping?
- What landscape practices lead to high-quality workmanship?
- How can reflecting on our work help us improve and prepare for future opportunities?
- Why is documenting work experiences important for career readiness?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
9.8.1 Professionalism and Employability	• **Identify work-ready skills that reflect professionalism on a jobsite or in a workshop** • **Describe how attributes of the CTECS Vision of a Graduate relate to the construction industry** • **Demonstrate respectful behavior, effective communication, social skills, and work readiness while working in team and individual settings** • **Apply critical thinking and problem-solving skills to complete tasks and resolve challenges in a professional setting**

9.8.2 Technical Skills	• **Apply core landscaping skills including:**
	  ○ **Measuring and layout**
	  ○ **Tool selection and use**
	  ○ **Plant and turf installation and maintenance**
	  ○ **Hardscape installation techniques**

Students will know:	*As evidenced by: (oral, written, or performance)*
	○ **Basic small engine inspection, maintenance, and repair** ● **Demonstrate safe and appropriate practices related to:** ○ **Personal Protective Equipment (PPE) and environmental awareness** ○ **Operation and maintenance of landscape equipment** ○ **Proper lifting, loading, and handling techniques** ○ **Safe use of hand and power tools for outdoor work** ● **Evaluate quality of work based on project specifications and industry standards** ● **Follow organized processes to complete tasks efficiently and accurately**
9.8.3 Portfolio and Reflection	● **Identify key components of a professional portfolio (e.g., photos, checklists, reflections, resume artifacts)** ● **Upload documentation and evidence of proficiency for each project completed** ● **Update personal competency checklist to reflect current skill levels and progress** ● **Reflect on personal growth in both technical and employability skills**

Technical Vocab-

Workmanship, competency, portfolio, resume, reflection, jobsite, professionalism, proficiency.

Resources-

Landscape Design, Installation, and Management (GW)

10th Grade Curriculum

Priority Standard 10.1 - Shop/Site Safety (OSHA 10 Credentialing)

Big Idea(s):

- Safety is the responsibility of everyone in the shop
- More powerful tools introduce greater risks, requiring stricter inspection and safety routines
- Industry credentials like OSHA-10 support long-term safety understanding and employability
- Training and awareness can prevent injuries

Essential Question(s):

- How can hazard awareness prevent accidents?
- How do safety practices evolve with more powerful tools?
- What's the value of earning a recognized safety credential like OSHA-10?
- How does one worker's action affect the other workers on a jobsite?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.1.1 Review of Core Safety ● **Hazard Awareness** ● **PPE** ● **SDS** ● **Fire Safety**	● **Reinforce PPE, behavior, and emergency procedures** ● **Apply safety protocols to new shop tools and environments** ● **100% on written safety test**
10.1.2 Stationary and Power Tool Safety	● **Identify hazards associated with saws, sanders, and planers** ● **Perform visual/tool safety inspections (blades, cords, guards)** ● **Demonstrate safe procedures for common tools** ● **100% on written safety test**
10.1.3 Seasonal and Outdoor Safety	● **Recognize risks from sun, cold, insects, and ground conditions** ● **Introduce visibility clothing for roadside or site work** ● **100% on written safety test**
10.1.4 Safety Credentialing	● **Complete OSHA-10 Construction or General Industry credential** ● **Demonstrate knowledge through coursework and written assessment**

Technical Vocab-

Stationary Equipment, Kickback, Lockout/Tagout (LOTO), OSHA-10, Hazard Communication (HazCom), Emergency Stop, Guarding, Extension Cord Safety, Visibility Gear, Heat Stress, Cold Stress, Safety Data Sheet (SDS)

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.2 - Power Tools

Big Idea(s):

- Power tools improve efficiency and precision in landscape and construction tasks
- Safe operation and tool selection are essential for quality workmanship
- Introductory exposure to greenscape tools builds foundational skills for future work

Essential Question(s):

- How do portable power tools enhance productivity and quality in hardscape and construction projects?
- What safety practices are essential when using cutting, grinding, and fastening tools?
- What basic greenscape tools support early landscaping tasks?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.2.1 Tool Identification and Function ● **Circular saws** ● **Reciprocating saws** ● **Impact drivers** ● **Angle grinders** ● **Rotary hammers** ● **Drills** ● **Demolition Saw** ● **Concrete/Tile Saw** ● **Paddle mixers**	● **Identify and describe the purpose of each tool** ● **Match tools to common jobsite tasks (e.g., cutting, mixing, fastening)** ● **Identify basic parts and accessories of each tool (e.g., blades, bits, guards)**
10.2.2 Safety Practices and Pre-Use Inspections	● **Demonstrate proper PPE use when operating tools** ● **Perform pre-use inspections and identify unsafe tool conditions** ● **Explain and demonstrate correct grip, stance, and cutting position** ● **Pass safety quizzes or demonstrations with 100% accuracy**
10.2.3 Introduction to Greenscape Tools	● **Identify and operate basic tools used to maintain greenscapes** ● **Demonstrate proper startup, operation, and shutdown of each tool** ● **Perform basic maintenance: cleaning, string replacement, and safe storage**

Technical Vocab-

Circular saw, Reciprocating saw, Paddle mixer, Impact driver, Angle grinder, Rotary hammer, Bit, Blade guard, RPM, PPE, Lock-out tag-out, Kickback, Pre-use inspection, String trimmer, Leaf blower, Aerator, Maintenance, Cordless vs. corded, Battery life, Safety switch

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.3 - Measurement & Math II

Big Idea(s):

- Geometry and measurement allow precise material estimation
- Volume calculations are key to soil, mulch, and concrete work
- Converting units is necessary for working across systems and scales
- Proper selection and use of measuring tools ensure accuracy in planning and installation

Essential Question(s):

- What methods are used to estimate materials for landscape and construction tasks?
- How do unit conversions impact accuracy and efficiency in fieldwork?
- How does geometry influence the function and aesthetics of a landscape?
- What tools are best suited for different types of measurements and calculations?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.3.1 Applied Geometry and Unit Conversions	• **Demonstrate conversion between standard and metric units** • **Calculate area, volume, and slope using appropriate formulas** • **Apply measurements to determine material needs for turf, mulch, and hardscape**
10.3.2 Landscape Estimation Basics	• **Estimate mulch, soil, and stone needed using volume calculations** • **Apply spacing formulas for plant installation** • **Calculate paver and retaining wall materials based on layout dimensions**
10.3.3 Measuring Tools and Applications	• **Identify and use appropriate measuring tools (e.g., tape measure, laser level, transit)** • **Select tools based on precision required for layout or estimation** • **Perform accurate measurements using slope meters, rulers, and measuring wheels**

Technical Vocab-

Volume, square footage, cubic yard, unit conversion, slope, grade, estimate, spacing, measuring tape, measuring wheel, laser level, transit

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.4 - Hardscapes Design and Blueprint Reading

Big Idea(s):

- Technical drawings are essential for communicating hardscape design
- Blueprint reading ensures accuracy and precision during installation
- Materials, layout, and measurements must be clearly conveyed in design documentation
- Site layout and construction depend on clear hardscape plans

Essential Question(s):

- How are hardscape designs communicated through blueprints?
- Why must scale and dimension be accurate in construction drawings?
- What elements make a hardscape blueprint complete and usable on site?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.4.1 Hardscape Blueprint Symbols, Lines, and Layout	• **Identify blueprint symbols specific to patios, walls, and walkways** • **Interpret layout diagrams showing dimensions, grades, and footing details** • **Apply line types (e.g., object, hidden, dimension) to hardscape plans**
10.4.2 Scale, Measurement, and View Types for Hardscape Plans	• **Use architectural scale to develop and interpret site plans** • **Draw plan, elevation, and cross-section views of hardscape elements** • **Convert between measurement units for material calculations**
10.4.3 Basic Hardscape Design Elements	• **Design patio, walkway, and retaining wall layouts to scale** • **Label slope direction, drainage points, and elevation changes** • **Annotate materials, layout patterns, and construction notes on plans**
10.4.3 Site Regulations and Planning Considerations	• **Recognize common zoning codes and accessibility requirements affecting layout and grading** • **Explain how regulations such as ADA compliance or setback rules affect design choices**

Students will know:	*As evidenced by: (oral, written, or performance)*
	• **Identify key elements of erosion control and stormwater management in site planning** • **Explain the importance of aligning site design with legal and environmental requirements**

Technical Vocab-

Blueprint, scale ruler, object line, dimension line, symbol, notation, architectural scale, detail view, hardscape layout, elevation

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.5 - Surveying, Grading, and Layout

Big Idea(s):

- The principles of grading and earthwork, including slope calculations and the impact of grading on land development, are imperative to LDIE
- Accurate surveying is critical to land management, construction, and civil engineering applications
- Proper site layout ensures structural integrity, efficient use of land, and compliance with regulations
- Understanding legal aspects of land use is necessary for responsible development

Essential Question(s):

- Why is accurate land measurement essential for property boundaries and land development?
- Why is proper grading and earthwork essential in construction and land development?
- How does surveying support planning and development of landscapes and infrastructure?
- What legal considerations must be taken into account when working with land?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.5.1 Introduction to Surveying	• **Explain the purpose and importance of surveying in landscaping and construction** • **Analyze the historical development and evolution of surveying tools and methods** • **Identify and describe common types of surveys (land, construction, topographic, boundary)** • **Demonstrate the proper setup and use of surveying equipment such as levels and tripods**
10.5.2 Map Reading, Interpretation, and Technology	• **Read and interpret topographic maps and contour lines** • **Explain the use of coordinate systems and map scales in site layout** • **Describe basic use of surveying technology, including theodolites, laser levels, and GPS/GNSS devices** • **Interpret elevation data and slope direction for site analysis**

Students will know:	*As evidenced by: (oral, written, or performance)*
10.5.3 Land Records and Legal Aspects	• **Identify components of land records such as deeds, easements, and zoning maps** • **Analyze the Public Land Survey System (PLSS) and how it defines land ownership** • **Interpret legal descriptions of land parcels and boundaries** • **Examine local codes, regulations, and permits related to surveying and layout**
10.5.4 Principles of Grading	• **Explain the importance of grading in site preparation and water management** • **Identify grading symbols and contours on site plans** • **Calculate slope and elevation changes using site data** • **Describe how grading supports landscape function and aesthetics**
10.5.5 Grading Plans and Site Design	• **Develop basic grading plans that incorporate slope, drainage, and site access** • **Explain drainage techniques and erosion control methods in construction** • **Design layouts for driveways, roads, and infrastructure based on topography** • **Interpret and use calculations to lay out site features accurately**

Technical Vocab-

Surveying, topography, theodolite, contour, grading, elevation, coordinates, boundary, geodetic, GPS, land parcel, cut and fill, grid system, benchmark, erosion control, site layout, leveling

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.6 - Plants II: Health, Pests, and Seasonal Maintenance

Big Idea(s):

- Disease, pests, and poor practices threaten plant health
- Sustainable methods like IPM protect plants and the environment
- Seasonal planning ensures year-round plant care

Essential Question(s):

- How do we protect plants from pests and disease?
- What are the advantages of sustainable practices?
- How do seasons affect plant maintenance?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.6.1 Growth Processes	• **Explain seed germination, dormancy, and pollination** • **Identify pollinator-friendly plant species** • **Differentiate between deciduous and evergreen species based on seasonal characteristics** • **Analyze the importance of growth stages in seasonal care**
10.6.2 Pest & Disease Management	• **Identify common pests and plant diseases** • **Describe symptoms and signs of common plant health issues** • **Compare biological and chemical control methods** • Develop and present an Integrated Pest Management (IPM) plan
10.6.3 Advanced Maintenance Techniques	• **Diagnose plant health issues using visual and physical clues** • **Demonstrate proper use of pruning tools and safety practices** • **Recognize signs of species-specific plant stress, pest susceptibility, or pruning needs based on plant type** • **Apply shaping and topiary methods for aesthetic purposes** • **Perform thinning and raising techniques on selected plants**
10.6.4 Seasonal Landscape Tasks	• **Identify key maintenance tasks for**

Students will know:	*As evidenced by: (oral, written, or performance)*
	spring, summer, fall, and winter ● **Explain the importance of timing in pruning, fertilizing, and planting** ● **Develop a seasonal calendar and task checklist**
10.6.5 Intro to Aquaponics	● **Identify key components of a basic aquaponic system** ● **Explain the role of plants, fish, and bacteria in nutrient cycling** ● **Construct a small-scale aquaponics model**

Technical Vocab-

Pest control, pruning, soil pH, mulch, fertilizer, disease resistance, integrated pest management (IPM), propagation, dormancy, pollination

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.7 - Hardscape Installation

Big Idea (s):

- Different hardscape materials serve distinct structural and decorative functions
- Successful paver and wall installations require precise layout, cutting, leveling, and compaction
- Wood-framed landscape structures combine carpentry skills with exterior design principles
- Regular maintenance ensures the longevity and safety of hardscape installations
- Troubleshooting and seasonal care are essential aspects of professional landscape management

Essential Question (s):

- How do the properties of various hardscape materials influence construction methods and site selection?
- Why are retaining wall design and drainage essential to structural integrity?
- What considerations must be made when designing and building wooden structures for outdoor environments?
- How can proactive maintenance and troubleshooting prevent costly repairs in hardscape projects?
- What installation practices ensure hardscapes are both functional and visually appealing?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.7.1 Hardscape Materials and Construction	• **Identify common hardscape materials and their purposes (stone, pavers, concrete, wood)** • **Describe the functions of hardscape components (SRW blocks, capstones, drainage aggregate, geogrid)** • **Compare decorative and structural hardscape applications** • **Select appropriate materials for varied site needs**
10.7.2 Paver Installation Techniques	• **Use a transit laser to set consistent grade and elevation** • **Use a saw to make accurate, clean paver cuts** • **Demonstrate common laying patterns (e.g., running bond, herringbone)** • **Follow industry standards to perform a complete paver installation, including proper spacing, alignment,**

Students will know:	*As evidenced by: (oral, written, or performance)*
	edge restraint, and compaction
10.7.3 Retaining Walls	• **Lay SRW blocks in level, staggered courses with correct batter** • **Backfill in lifts using drainage stone and filter fabric** • **Install geogrid at correct elevations and depths based on design requirements**
10.7.4 Wooden Structures • **Decks** • **Pergolas** • **Privacy Screens** • **Fences**	• **Identify key components of wood-framed structures (posts, beams, joists, ledger boards, anchors)** • **Read simple construction diagrams for wood structures** • **Install footings or anchoring systems according to plan** • **Build basic wood structures such as small decks, pergolas, or fences using proper fasteners and framing techniques** • **Apply finishing treatments (e.g., sealants, stains) appropriate to outdoor wood construction**
10.7.5 Landscape Maintenance • **Hardscape maintenance** • **Seasonal care/preservation** • **Troubleshooting hardscape issues**	• **Analyze proper maintenance techniques for hardscape elements** • **Discover seasonal care and preservation** **Diagnose common hardscape issues**

Technical Vocab-

Pavers, SRW (Segmental Retaining Wall) blocks, capstones, drainage aggregate, geogrid, edge restraint, compaction, transit laser, running bond, herringbone, batter, filter fabric, ledger board, joist, post anchor, fasteners, galvanized hardware, footings, stain, sealant, warping, spalling, efflorescence, frost heave, weed barrier, joint sand

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.8 - Soil Prep and Drainage

Big Idea(s):

- Soil conditions and drainage have a direct impact on the stability and lifespan of hardscape installations
- Proper grading and compaction techniques are essential to prevent structural failure and erosion
- Effective drainage systems help manage runoff and protect surrounding landscapes
- Sustainable soil and drainage practices improve environmental outcomes and long-term performance

Essential Question(s):

- How do soil type and compaction influence hardscape stability and drainage?
- What grading and drainage practices ensure proper water management in hardscape installations?
- Why is it important to analyze soil before beginning a hardscape project?
- How can we design hardscapes that manage water sustainably?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.8.1 Soil Assessment and Preparation	• **Differentiate between common soil types (clay, sand, silt, loam) and their properties** • **Perform basic soil testing to assess drainage and compaction needs** • **Prepare soil for hardscape installation using appropriate methods such as excavation, subgrade preparation, and compaction** • **Identify signs of poor subsoil conditions and recommend corrective actions**
10.8.2 Grading Principles for Hardscapes	• **Explain the role of grading in preventing water pooling and structural damage** • **Use slope and elevation measurements to establish correct pitch for patios, walkways, and retaining walls**

Students will know:	*As evidenced by: (oral, written, or performance)*
	• **Apply industry-recommended grading tolerances to ensure proper runoff direction** • **Set up and use leveling tools (e.g., string line, laser level) to establish grade**
10.8.3 Drainage Solutions and Installation	• **Identify different types of drainage systems (e.g., French drains, swales, perforated pipe)** • **Match appropriate drainage systems to site conditions** • **Install basic drainage components such as drain tile, catch basins, and filter fabric** • **Integrate drainage systems into hardscape designs without compromising aesthetics**
10.8.4 Sustainable Practices and Troubleshooting	• **Describe sustainable drainage practices such as rain gardens and permeable pavers** • **Explain how native plants and proper grading reduce runoff and soil degradation** • **Troubleshoot common drainage issues (e.g., standing water, erosion) and propose solutions** • **Recommend environmentally friendly products and practices for soil and water management**

Technical Vocab-

Soil type, compaction, subgrade, grading, slope, pitch, runoff, percolation, drainage system, French drain, swale, perforated pipe, catch basin, filter fabric, erosion, sediment, rain garden, sustainable drainage, infiltration rate, laser level

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 10.9 - Intro to Small Engine Repair

Big Idea(s):

- The basic principles of small engine operation encompass both two-stroke and four-stroke engines
- Safety protocols and procedures are crucial when working with small engines and power tools
- Key components in small engines, such as carburetors, ignition systems, and fuel systems, have specific functions that are essential to understand
- Routine maintenance tasks, including oil changes, air filter replacements, and spark plug inspections, are fundamental to engine upkeep

Essential Question(s):

- How do two-stroke and four-stroke engines differ, and what impact do these differences have on their operation and maintenance?
- Why are safety protocols, including PPE, essential when working with small engines?
- How do the main components of a small engine contribute to its operation?
- Why is it important to follow specific step-by-step procedures for routine maintenance tasks like oil changes and air filter replacements?
- How does understanding the function of each small engine component aid in effective troubleshooting and repair?
- Why is regular maintenance important for the longevity and performance of small engines?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.9.1 Engine Basics	• **Describe the development of small engines historically** • **Compare and contrast two-stoke vs four-stroke engines** • **Identify all the necessary components** • Analyze component functions
10.9.2 Safety Procedures	• **Identify proper PPE for small engine repair** • **Receive 100% on the safety test** • **Create a fuel safety and chemical safety plan**

10.9.3 Routine Maintenance	• **Conduct basic maintenance on mock small engines**
	• Diagnose engine issues around:
	  ○ Air filter
	  ○ Spark plugs

Students will know:	*As evidenced by: (oral, written, or performance)*
10.9.4 Basic Troubleshooting	• **Compare and contrast, no start, poor performance, and overheating** • **Troubleshoot basic issues with small engines** • **Complete diagnostic testing on compression, spark, and fuel checks**

Technical Vocab-

Small Engine, Two-Stroke Engine, Four-Stroke Engine, Combustion Chamber, Crankshaft, piston, Compression Stroke, Power Stroke, Intake Stroke, Exhaust Stroke, Personal Protective Equipment (PPE), Workshop Safety, Hazardous Chemicals, Ventilation, Fire Safety, Emergency Procedures, Engine Oil, Oil Change, Air Filter, Spark Plug, Fuel System, Fuel Filter, Routine Maintenance, troubleshooting, No-Start Condition, Overheating, Compression Testing, Spark Testing, fuel System Check, Diagnostic Tools

Resources-

Equipment and Engine Training Council

Priority Standard 10.10. - Professional Practice in Landscaping

Big Idea(s):

- Professional and technical skills are demonstrated through the process and product of hands-on landscaping work
- Landscape design and installation projects provide opportunities to apply core competencies in real-world outdoor environments
- Employability attributes such as communication, problem-solving, and professionalism are critical to success in the green industry
- Reflection and portfolio documentation are essential for tracking growth and preparing for career opportunities

Essential Question(s):

- How do professional behaviors and employability skills impact success in landscaping?
- What landscape practices lead to high-quality workmanship?
- How can reflecting on our work help us improve and prepare for future opportunities?
- Why is documenting work experiences important for career readiness?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
10.10.1 Professionalism and Employability	• **Identify work-ready skills that reflect professionalism on a jobsite or in a workshop** • **Describe how attributes of the CTECS Vision of a Graduate relate to the construction industry** • **Demonstrate respectful behavior, effective communication, social skills, and work readiness while working in team and individual settings** • **Apply critical thinking and problem-solving skills to complete tasks and resolve challenges in a professional setting**

10.10.2 Technical Skills	• **Apply core landscaping skills including:**
	  ○ **Measuring and layout**
	  ○ **Tool selection and use**
	  ○ **Plant and turf installation and maintenance**
	  ○ **Hardscape installation techniques**

Students will know:	*As evidenced by: (oral, written, or performance)*
	○ **Basic small engine inspection, maintenance, and repair** ● **Demonstrate safe and appropriate practices related to:** ○ **Personal Protective Equipment (PPE) and environmental awareness** ○ **Operation and maintenance of landscape equipment** ○ **Proper lifting, loading, and handling techniques** ○ **Safe use of hand and power tools for outdoor work** ● **Evaluate quality of work based on project specifications and industry standards** ● **Follow organized processes to complete tasks efficiently and accurately**
10.10.3 Portfolio and Reflection	● **Identify key components of a professional portfolio (e.g., photos, checklists, reflections, resume artifacts)** ● **Upload documentation and evidence of proficiency for each project completed** ● **Update personal competency checklist to reflect current skill levels and progres** ● **Reflect on personal growth in both technical and employability skills**

Technical Vocab-

Workmanship, competency, portfolio, resume, reflection, jobsite, professionalism, proficiency.

Resources-

Landscape Design, Installation, and Management (GW)

11th Grade Curriculum

Priority Standard 11.1- Jobsite Safety

Big Idea(s):

- Safety is the responsibility of everyone in the shop
- Outdoor power tools introduce new hazards, particularly around fuel and mechanical failure
- Safe operation and maintenance go hand-in-hand
- CBYD is necessary for any and all work sites

Essential Question(s):

- How can hazard awareness prevent accidents?
- Who is ultimately responsible for a safe work environment?
- How can no lost time accidents benefit you as a business owner?
- Why are outdoor tools more hazardous than shop tools?
- How can daily inspections prevent injuries and breakdowns?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.1.1 Review of Core Safety Principles • **Hand tools,** • **Personal Safety** • **Job-Site Safety** • **SDS** • **Other**	• **Recall safety expectations from prior years, including PPE, safe behavior, and hazard awareness** • **Explain the importance of annual safety retraining and continuous adherence to core safety rules** • **Demonstrate safe habits during daily shop and field routines** • **Score 100% on the written safety test**
11.1.2 Landscape PPE and Hazard Awareness	• **Identify required PPE for outdoor power equipment, including chaps, gloves, face shields, and hearing protection** • **Describe the purpose of each PPE item in reducing injury risk** • **Recognize common outdoor hazards such as uneven terrain, overhead branches, or tripping risks** • **Score 100% on the written safety test**
11.1.3 Fuel Safety and Chemical Handling	• **List common fuels and chemicals used in landscape equipment** • **Demonstrate safe procedures for transporting, storing, and refueling with gasoline and mixed fuel**

Students will know:	*As evidenced by: (oral, written, or performance)*
	• **Explain how to respond to spills and safely handle chemicals such as oil, lubricants, and fertilizer**
11.1.4 Outdoor Power Equipment Safety	• **Inspect gas-powered tools (e.g., mowers, chainsaws, hedge trimmers) for safety before use** • **Operate each tool using correct starting procedures, body positioning, and grip** • **Explain how improper use can cause specific hazards (kickback, flying debris, etc.)**
11.1.5 Equipment Maintenance and Safety Checks	• **Perform routine maintenance on outdoor tools (sharpen blades, clean filters, tighten guards)** • **Document pre-use and post-use safety checks in a log or checklist** • **Identify signs of tool malfunction and report unsafe conditions**

Technical Vocab-

Chainsaw Safety, Face Shield, Hearing Protection, Fuel Container, Overheating, Vibration Fatigue, Gas Leak, Flammable, Two-Stroke Engine, Chaps, Spill Kit, Tool Guard, Recoil Starter, Blade Guard, PPE, Inspection Log

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.2- Small Power Equipment

Big Idea (s):

- Power equipment is essential for landscape installation and maintenance tasks
- Safe and effective operation of landscape power equipment requires understanding of both handling techniques and routine maintenance
- Regular maintenance extends equipment life and ensures reliable performance

Essential Question (s):

- How does each type of landscape power equipment contribute to different landscaping tasks?
- What safety measures are essential when operating high-risk landscape tools?
- Why is routine maintenance critical to the functionality and longevity of power equipment?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.2.1 Equipment Identification and Operation ● **Push and riding mowers** ● **Chainsaws** ● **Hedge trimmers** ● **String trimmers (gas or battery-powered)** ● **Leaf blowers**	● **Identify the purpose and features of:** ● **Demonstrate correct startup, operation, and shutdown procedures** ● **Match each tool to its best use case in landscape tasks**
11.2.2 Safety Practices and Pre-Operation Checks	● **Perform pre-use inspections (fuel, oil, blades, cords, loose parts)** ● **Identify PPE specific to each tool (e.g., chainsaw chaps, hearing protection)** ● **Pass tool-specific safety tests** ● **Demonstrate safe handling, including proper posture, grip, and awareness of surroundings**
11.2.3 Routine Maintenance and Storage	● **Sharpen mower and trimmer blades using appropriate techniques** ● **Clean and replace air filters and spark plugs** ● **Inspect and refill oil/fuel (as applicable)** ● **Wind trimmer line properly** ● **Safely store tools in accordance with manufacturer guidelines**

Students will know:	*As evidenced by: (oral, written, or performance)*
11.2.4 Troubleshooting and Field Repairs	• Diagnose issues such as no-start conditions, engine sputtering, or overheating • Perform minor repairs: replacing trimmer line, changing spark plugs, clearing clogs, or adjusting carburetors (basic) • Document maintenance and troubleshooting steps in a log or checklist

Technical Vocab-

Chainsaw, String trimmer, Hedge trimmer, Push mower, Riding mower, Air filter, Spark plug, Throttle, Carburetor, Fuel mix, Chain tension, Trimmer line, Blade sharpening, Choke, Primer bulb, Pre-use inspection, PPE, Field repair, Storage protocol

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.3 - Measurement & Math III

Big Idea(s):

- Geometry and measurement connect fieldwork to blueprint interpretation
- Accurate slope and elevation calculations support grading and drainage planning
- Quantitative takeoffs improve planning, budgeting, and execution of work

Essential Question(s):

- How do blueprint dimensions and scale influence material estimation in the field?
- In what ways does slope calculation affect landscape layout and drainage?
- What techniques ensure accurate takeoffs for complex construction projects?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.3.1 Hardscape Estimation and Takeoffs	• **Calculate material needs for paver areas, concrete pours, and retaining walls** • **Estimate reinforcement and drainage materials based on site conditions** • **Interpret scaled drawings to extract real-world quantities and dimensions**
11.3.2 Slope and Elevation Calculations	• **Calculate changes in elevation using rise-over-run and percent slope** • **Interpret and apply information from contour maps and site plans** • **Use slope data to determine cut and fill volumes**

Technical Vocab-

Elevation, slope, contour, takeoff, estimate, scale, cubic footage, reinforcement, cut and fill, grade stake, benchmark

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.4 - Greenscape Design and Planting Plans

Big Idea(s):

- Blueprint reading applies to softscape elements like trees, shrubs, and planting beds
- Planting plans must communicate species, spacing, and placement
- Environmental conditions influence softscape layout and design decisions
- Designers must balance function, aesthetics, and maintenance

Essential Question(s):

- How are plants and planting beds represented on blueprints?
- What role do space and species selection play in planting design?
- How do soil, sunlight, and water access impact planting layout?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.4.1 Reading and Developing Planting Plans	• **Identify blueprint symbols for trees, shrubs, perennials, and beds** • **Interpret planting schedules and species keys** • **Draw and label a basic planting plan using proper symbology and scale**
11.4.2 Environmental and Site-Based Considerations	• **Analyze site conditions for sunlight, soil, and drainage** • **Adjust planting plans based on microclimates or access concerns** • **Identify native and non-native species and their implications in design**
11.4.3 Layout of Greenscape Elements	• **Calculate spacing based on plant maturity and root spread** • **Layout bed edges and planting holes using blueprint references** • **Use measuring and marking tools for field installation**
11.4.4 Drafting and Sketching	• **Design an integrated landscape using specified drawing techniques** • **Identify various landscape symbols and conventions** • **Create an entire greenscape blueprint (no hardscapes)**

Technical Vocab-

Planting plan, planting schedule, bed layout, spacing, microclimate, native species, root zone, soil conditions, blueprint symbol

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.5 - Soil Science

Big Idea(s):

- The properties and components of soil are relevant in landscaping
- Different soil types and their characteristics can be identified
- Soil quality impacts plant health and growth
- Knowledge of soil science is applied to select appropriate plants for landscaping projects

Essential Question(s):

- Why is soil significant in landscaping, and how does soil composition affect plant growth and health?
- How can we identify and classify different soil types, and why is this important for landscaping projects?
- What methods and tools are used to analyze soil properties, and how can we interpret soil test results to make informed landscaping decisions?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.5.1 Advanced Soil Science and Properties ● **Advanced soil composition** ○ **Horizon** ○ **Profile** ○ **Texture** ○ **Structure** ○ **pH** ○ **Nutrients** ○ **Moisture** ○ **Drainage**	● **Identify soil composition and explain its importance to landscape planning** ● **Compare and contrast various soil properties**
11.5.2 Advanced Soil Testing ● **Various soil testing techniques** ● **Soil testing methods** ● **Interpreting soil results**	● **Utilize soil sampling techniques** ● **Analyze soil testing methods** ● **Interpret soil test results** ● **Create a plan for remedying soil issues**
11.5.3 Plant Selection and Soil Compatibility ● **Plant soil preference** ● **Soil amendments/improvements**	● **Identify plant types and their soil preferences** ● **Design a soil/plant plan for a mock client** ● **Analyze soil testing results and apply it to a mock client**

Technical Vocab-

Soil Composition, Soil Structure, Soil Horizons, Soil Texture, Soil pH, Soil Nutrients, Soil Moisture, Soil Drainage, Soil Sampling, Soil Testing, Soil Analysis, Soil Amendments

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.6 - Plants III: Plant Science & System Design

Big Idea(s):

- Cellular structures and transport systems support plant function and growth
- Photosynthesis and respiration drive plant productivity and energy conversion
- Environmental factors influence plant health and system design
- Closed-loop systems like aquaponics demonstrate the relationship between biology and sustainability

Essential Question(s):

- How do internal plant structures support growth and survival?
- In what ways do photosynthesis and respiration impact the health of a plant system?
- How can environmental conditions alter plant performance?
- What can aquaponics teach us about sustainability in agriculture?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.6.1 Advanced Plant Structure and Function	• **Explain the role of cellular structures and organelles in plant processes** • **Identify plant tissues and organs through observation and diagrams** • **Diagram vascular and transport systems within plant anatomy**
11.6.2 Photosynthesis & Respiration	• **Create visual models to represent photosynthetic and respiration pathways** • **Describe the process of cellular respiration and energy transfer in plants** • **Analyze environmental variables affecting photosynthesis and respiration rates**
11.6.3 Aquaponics as a System	• **Identify nutrient and water cycling processes within a closed-loop aquaponic system** • **Analyze ecological interactions within a self-contained plant and fish system** • **Evaluate system performance and propose improvements to maintain plant health**
11.6.4 Advanced Plant Identification and Selection	• **Identify common native and invasive trees, shrubs, and herbaceous plants using field characteristics**

Students will know:	*As evidenced by: (oral, written, or performance)*
	• **Use dichotomous keys and mobile tools to accurately identify plant species** • **Compare plant species for landscape use based on soil, sun, and climate conditions** • **Select appropriate plant species for ecological balance and design goals**

Technical Vocab-

Cell structure, vascular system, chloroplast, photosynthesis, respiration, ATP, stomata, transpiration, ecosystem, nutrient cycling, aquaponics, sustainability, closed-loop system

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.7 - Turf Management

Big Idea(s):

- Turfgrass contributes both functional and aesthetic value to landscapes and must be managed responsibly
- Turfgrass species, nutrition, and establishment methods impact turf health and longevity
- Proper maintenance practices and equipment use are essential to professional turf management
- Sustainability and environmental stewardship are integral to long-term turf care

Essential Question(s):

- How does turfgrass support both landscape function and environmental health?
- What factors determine the best turfgrass species for a given site?
- How do you establish and maintain healthy turf through proper care and equipment use?
- How can turf be managed sustainably while balancing performance, cost, and environmental concerns?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.7.1 Turfgrass Foundations	• **Identify the purpose and benefits of turfgrass in landscaping** • **Describe environmental impacts of turf use and management** • **Explore career opportunities and certifications in turf management**
11.7.2 Turfgrass Species and Establishment	• **Identify common cool- and warm-season turfgrass species and their characteristics** • **Match turf types to site and climate conditions** • **Demonstrate turf establishment methods including seeding, sodding, and hydroseeding** • **Explain the importance of soil preparation for healthy turf development**
11.7.3 Lawn Maintenance and Equipment Use	• **Demonstrate safe and proper use of turf maintenance equipment (mowers, edgers, trimmers)** • **Describe mowing techniques and patterns for healthy turf** • **Plan edging, dethatching, aeration, and compaction relief strategies**

Students will know:	*As evidenced by: (oral, written, or performance)*
	• **Perform basic maintenance and troubleshooting of turf equipment**
11.7.4 Soil Nutrition and Fertility	• **Review soil components including sand, silt, clay, and organic matter** • **Conduct soil tests to evaluate pH, nutrient levels, and fertility needs** • **Differentiate between organic and synthetic fertilizers and common soil amendments (e.g., lime, compost)** • **Calculate and apply appropriate fertilizer rates and application methods based on soil test results and turf needs** • **Explain how overuse or misuse of fertilizers can affect turf health and the environment**
11.7.5 Best Management Practices	• **Identify environmentally responsible practices (e.g., organic care, water conservation)** • **Create a seasonal turf maintenance calendar aligned with best management practices (BMPs)** • **Develop a budget and record-keeping system to support turf operations** • **Explain integrated pest and weed management strategies for long-term care**

Technical Vocab-

Turfgrass, Cool-season grasses, Warm-season grasses, Seeding, Sodding, Hydroseeding, Soil pH, Nutrients, Fertilization, Thatch, Compaction, Aeration, Mowing Patterns, Edging, Organic Lawn Care, Water Conservation, IPM (Integrated Pest Management), Weed Control, Equipment Maintenance, Turf Maintenance Plan, Record-keeping, Environmental Stewardship

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.8 - Disease Weeds and Pesticides

Big Idea(s):

- Weed, pest, and disease management is essential to maintaining healthy, sustainable landscapes
- Integrated Pest Management (IPM) promotes responsible control strategies that balance effectiveness with environmental impact
- Safe and legal pesticide use requires knowledge of application methods, safety protocols, and regulatory standards

Essential Question(s):

- Why are weeds, pests, and diseases major concerns in landscape management, and how do they affect long-term sustainability?
- What tools and techniques can we use to manage these issues safely and effectively?
- How does Integrated Pest Management (IPM) help balance pest control with environmental stewardship?
- What laws and safety procedures must be followed when using pesticides?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.8.1 Advanced Weed Identification and Management	• **Identify common weeds in landscaping** • **Analyze the weed life cycles and reproduction** • **Utilize weed control methods** • **Analyze organic weed management techniques**
11.8.2 Pesticides	• Explain the use of different types of Pesticides • **Identify safety precautions needed when using pesticides** • **Demonstrate ability to use pesticide application equipment** • **Articulate the legal regulations on pesticide use**
11.8.3 Advanced Integrated Pest Management (IPM)	• **Identify the principles of IPM** • **Explain the process for monitoring and scouting for pests** • **Design a plan to help control biological methods** • **Create an IPM plan**
11.8.4 Environmental and Sustainability	• **Identify the environmental impact of**

Students will know:	*As evidenced by: (oral, written, or performance)*
Consideration	**pesticides** ● **Describe the importance of sustainable landscaping practices** ● **Construct an alternative pest control strategy plan**

Technical Vocab-

Disease, Pathogen, Symptoms, Diagnosis, Weeds, Herbicide, Pest, Pesticide, IPM (Integrated Pest Management), Resistance, Biodegradable, Environmental impact, Safety precautions, Sustainability

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 11.9 - Advanced Small Engine Repair

Big Idea(s):

- Developing problem-solving techniques is essential for diagnosing common small engine issues, such as starting problems, poor performance, and unusual noises
- Learning repair techniques for common problems involves tasks like carburetor cleaning, fuel system adjustments, and replacing engine components
- Proficiency in using tools and equipment specific to small engine repair, including wrenches, socket sets, and diagnostic tools, is crucial
- Understanding the environmental impact of small engines and the importance of ethical practices in their repair and maintenance is key in LDIE

Essential Question(s):

- Why do common issues occur with small engines, and how can they be diagnosed effectively?
- How can systematic troubleshooting techniques be applied to identify and resolve engine performance problems?
- How do you determine when to repair versus replace components in a small engine, and what factors influence this decision?
- How do different repair techniques, such as carburetor cleaning or spark plug replacement, address specific engine issues?
- What are the essential tools and equipment used in small engine repair, and how should they be properly utilized?
- How does proficiency in using diagnostic tools contribute to accurate problem diagnosis and efficient repairs?
- Why is it important to adhere to ethical practices, such as proper disposal of engine fluids and recycling of parts, in small engine repair?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.9.1 Fuel System Diagnostics and Repair	• **Demonstrate carburetor cleaning and adjustment to manufacturer specifications** • **Inspect fuel system components for clogs, leaks, or degradation** • **Diagnose common fuel delivery issues** • **Replace and test fuel filters for proper flow**
11.9.2 Ignition and Electrical System Repair	• **Diagram how an ignition system works** • **Identify all the points in an ignition**

Students will know:	*As evidenced by: (oral, written, or performance)*
	system ● **Perform battery maintenance, including charging and terminal cleaning**
11.9.3 Engine Teardown, Inspection, and Reassembly	● **Safely disassemble a small engine and organize components for inspection** ● **Identify wear or damage on pistons, cylinders, and valves** ● **Adjust valve timing and clearance using appropriate tools and specs** ● **Reassemble engine components to working condition following service manual guidance**
11.9.4 Sustainable and Ethical Repair Practices	● **Evaluate the environmental impact of small engine emissions and waste** ● **Create a written plan for proper disposal of engine fluids and worn parts** ● **Recommend sound-reduction techniques for various engine applications** ● **Compare ethical decision-making practices related to repairs, reuse, and replacement**

Technical Vocab-

Carburetor, Fuel System Adjustment, Fuel Injection System, Carburetor Cleaning, Carburetor Adjustment, Fuel Filter Replacement, Ignition System, Spark Plug Diagnosis, Points, Electronic Ignition, Battery Maintenance, Charging System, Engine Disassembly, Piston, cylinder, Valve Adjustment, Timing, Gasket Replacement, Environmental Impact, Recycling, Proper Disposal, Ethical Practices, Sustainability, Emissions, Decibel levels

Resources-

Equipment and Engine Training Council

Priority Standard 11.10 - Professional Practice in Landscaping

Big Idea(s):

- Professional and technical skills are demonstrated through the process and product of hands-on landscaping work
- Landscape design and installation projects provide opportunities to apply core competencies in real-world outdoor environments
- Employability attributes such as communication, problem-solving, and professionalism are critical to success in the green industry
- Reflection and portfolio documentation are essential for tracking growth and preparing for career opportunities.

Essential Question(s):

- How do professional behaviors and employability skills impact success in landscaping?
- What landscape practices lead to high-quality workmanship?
- How can reflecting on our work help us improve and prepare for future opportunities?
- Why is documenting work experiences important for career readiness?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
11.10.1 Professionalism and Employability	• **Identify work-ready skills that reflect professionalism on a jobsite or in a workshop** • **Describe how attributes of the CTECS Vision of a Graduate relate to the construction industry** • **Demonstrate respectful behavior, effective communication, social skills, and work readiness while working in team and individual settings** • **Apply critical thinking and problem-solving skills to complete tasks and resolve challenges in a professional setting**

11.10.2 Technical Skills	• **Apply core landscaping skills including:**
	  ○ **Measuring and layout**
	  ○ **Tool selection and use**
	  ○ **Plant and turf installation and maintenance**
	  ○ **Hardscape installation techniques**

Students will know:	*As evidenced by: (oral, written, or performance)*
	○ **Basic small engine inspection, maintenance, and repair** ● **Demonstrate safe and appropriate practices related to:** ○ **Personal Protective Equipment (PPE) and environmental awareness** ○ **Operation and maintenance of landscape equipment** ○ **Proper lifting, loading, and handling techniques** ○ **Safe use of hand and power tools for outdoor work** ● **Evaluate quality of work based on project specifications and industry standards** ● **Follow organized processes to complete tasks efficiently and accurately**
11.10.3 Portfolio and Reflection	● **Identify key components of a professional portfolio (e.g., photos, checklists, reflections, resume artifacts)** ● **Upload documentation and evidence of proficiency for each project completed** ● **Update personal competency checklist to reflect current skill levels and progress** ● **Reflect on personal growth in both technical and employability skills**

Technical Vocab-

Workmanship, competency, portfolio, resume, reflection, jobsite, professionalism, proficiency

Resources-

Landscape Design, Installation, and Management (GW)

12th Grade Curriculum

Priority Standard 12.1 - Jobsite Safety

Big Idea(s):

- Safety is the responsibility of everyone in the shop
- Working around large machinery and excavation equipment introduces critical safety concerns
- Legal compliance and procedural knowledge are essential when operating in the field
- Safety needs to be a habit and a consideration throughout daily living as well as in the work environment.
- Training and awareness can prevent injuries

Essential Question(s):

- What additional risks come with working near heavy equipment?
- Why is it essential to follow CBYD procedures before digging?
- Who is ultimately responsible for a safe work environment?
- How does one worker's action affect the other workers on a jobsite?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.1.1 Review of Core Safety Principles ● **hand tools,** ● **Personal Safety** ● **job-site safety** ● **SDS** ● **Other**	● **Recall safety practices from previous years, including PPE, hazard recognition, and equipment operation basics** ● **Demonstrate proper daily safety habits during shop and field activities** ● **Explain why routine retraining is important when progressing to more complex tools and machinery** ● **Score 100% on the written safety test**
12.1.2 Large Equipment Awareness and Field Protocol	● **Identify safety hazards associated with working around skid steers, excavators, and trenchers** ● **Explain the importance of reflective gear, line-of-sight communication, and traffic/pedestrian awareness in active work zones** ● **Demonstrate safe positioning when assisting equipment operators or working near machines in motion.** ● **Score 100% on the written safety test**
12.1.3 Equipment Inspection and	● **Perform daily inspections of heavy**

Students will know:	*As evidenced by: (oral, written, or performance)*
Emergency Readiness	**equipment and attachments, checking for wear, leaks, and function** ● **Respond appropriately to mechanical failures, including engine trouble, fluid leaks, or hydraulic failure** ● **Identify fire, tip-over, or pinch point hazards and demonstrate emergency stop procedures**
12.1.4 CBYD: Utility Safety and Legal Compliance	● **Describe the CBYD (Call Before You Dig) process and its importance in preventing underground utility damage** ● **Interpret utility markings and explain their color codes and meanings** ● **Explain the responsibilities of contractors and property owners regarding CBYD compliance** ● **Identify local and federal regulations tied to excavation work and summarize the potential legal and environmental consequences of non-compliance** ● **Complete the CBYD Online Course and apply learned procedures to simulated or real project planning scenarios**

Technical Vocab-

CBYD, Utility Markings, Excavation Hazards, Line-of-Sight, Reflective PPE, Lockout/Tagout, Pinch Point, Spotter, Hydraulic Failure, Emergency Stop, Trenching Safety, Tip-Over Risk, OSHA Trenching Standards, Underground Utilities, Regulatory Compliance

Resources-

www.cbyd.com; Landscape Design, Installation, and Management (GW)

Priority Standard 12.2 - Large Power Equipment

Big Idea(s):

- Advanced landscape equipment like skid steers and excavators significantly improve efficiency for heavy landscape work
- Operators must understand machine capabilities, safety protocols, and environmental impacts
- Even basic exposure to these machines helps students prepare for real-world job sites

Essential Question(s):

- What types of landscape tasks require the use of advanced equipment?
- Why is operator safety especially critical with heavy equipment?
- How does understanding machine capabilities inform equipment selection and use?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.2.1 Equipment Identification and Function ● **Skid steer** ● **Compact/mini excavator** ● **Mini track loader** ● **Bucket types and attachments (auger, forks, etc.)**	● **Identify components and operational purpose of common pieces of large power equipment used in landscaping** ● **Match equipment to appropriate landscaping tasks (e.g., grading, trenching, material handling)**
12.2.2 Safety and Pre-Operation Inspections	● **Perform daily walkaround inspections (fluid levels, tire/tracks, leaks, damage)** ● **Identify safety features: ROPS, seatbelts, emergency shutoff, backup alarm** ● **Use proper PPE for equipment operation** ● **Review jobsite hazards: overhead wires, soft soil, slopes, and people**
12.2.3 Basic Operation	● **Demonstrate proper mounting/dismounting and three-point contact** ● **Describe the steps to safely enter/exit the cab and adjust controls** ● **Maintain awareness of surroundings, signals, and communication protocols on site**

Technical Vocab-

Skid Steer, Compact Excavator, Loader, Tracks, Bucket, Auger, Forks, ROPS (Roll-Over Protection System), PPE, Back-up Alarm, Spotter, Three-Point Contact, Jobsite Hazard, Attachment, Operator's Station, Grading, Trenching

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 12.3 - Measurement & Math IV

Big Idea(s):

- Estimating and budgeting are essential for efficient project planning
- Math supports project proposals, bids, and profitability in the landscape industry
- Verifying site dimensions ensures fidelity between design and installation

Essential Question(s):

- How does accurate estimation impact job costing and profitability in landscape projects?
- What role does math play in verifying project layout and construction accuracy?
- How can calculated takeoffs inform decision-making during construction and revisions?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.3.1 Estimating, Bidding, and Budgeting	• **Estimate total material costs using unit prices and quantity takeoffs** • **Calculate labor estimates and apply overage factors to job proposals** • **Determine equipment usage costs based on time, fuel, and rental or depreciation rates** • **Develop an itemized bid or quote for a project using calculated values**
12.3.2 Field Verification and Layout Adjustments	• **Perform on-site measurements to confirm layout accuracy and design intent** • **Identify discrepancies between site conditions and plans** • **Adjust material estimates based on field changes or revisions**

Technical Vocab-

Bid, markup, unit price, labor cost, overhead, overage, tolerance, layout verification, quantity takeoff, site adjustment, cost per unit

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 12.4 - Advanced Landscape Design and Drawings

Big Idea(s):

- Advanced landscape plans integrate hardscape, softscape, and infrastructure features into a cohesive site layout
- Irrigation and lighting systems must be clearly documented for installation and maintenance
- Site-specific factors and local codes influence final design decisions
- A complete landscape drawing set communicates functional, aesthetic, and regulatory information

Essential Question(s):

- What additional systems must be considered in a complete landscape design?
- How are irrigation and lighting systems incorporated into construction drawings?
- How do site-specific conditions and local codes shape the final design?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.4.1 Integrated Construction Drawings	• **Combine softscape and hardscape elements into one comprehensive plan** • **Use appropriate line types, symbols, and annotations to differentiate components** • **Apply zoning requirements, ADA standards, and set-back guidelines to design layouts**
12.4.2 Irrigation and Drainage Systems	• **Identify zones and layout strategies for irrigation systems** • **Calculate water requirements for various zones based on plant needs and soil types** • **Incorporate valves, backflow preventers, and drainage structures into blueprint drawings**
12.4.3 Outdoor Lighting and Site Details	• **Identify types and purposes of landscape lighting (e.g., path, accent, security)** • **Layout circuits, timers, and low-voltage wiring plans in site drawings** • **Evaluate and select other site elements such as benches, fences, mailboxes, or signage to a finalized plan set**

Technical Vocab-

Irrigation zone, lighting circuit, backflow preventer, drainage basin, low-voltage lighting, ADA compliance, zoning setback, site furnishings, controller, zoning overlay

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 12.5 - Project Management

Big Idea(s):

- Effective project management ensures landscape jobs are completed on time, on budget, and to client specifications
- Clear communication, accurate planning, and informed decision-making are essential skills for managing landscape projects
- Professional planning incorporates scope, scheduling, estimation, and client interactions

Essential Question(s):

- How do you plan and manage a landscaping project from start to finish?
- What tools and methods support effective time, cost, and resource management?
- How does client communication influence project planning and outcomes?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.5.1 Project Planning and Scope	• **Identify key components of a landscape project proposal** • **Define project goals and scope based on client expectations** • **Develop a basic landscape project work plan**
12.5.2 Scheduling and Workflow	• **Create a task list and sequence of operations using planning tools (e.g., Gantt chart or calendar)** • **Estimate realistic timelines for major phases of a project** • **Identify critical path tasks that influence completion dates**
12.5.3 Estimating and Budgeting	• **Estimate material, equipment, and labor costs for a landscape project** • **Calculate total project cost and identify potential overruns** • **Adjust project plans to align with client budgets and priorities**
12.5.4 Client Communication and Presentation	• **Develop a professional project presentation with visuals and/or sketches** • **Explain project plan, timeline, and budget to a client or audience** • **Respond to client questions and feedback in a professional manner**

Technical Vocab-

Project scope, project proposal, scheduling, Gantt chart, critical path, estimate, labor cost, materials cost, contingency, overhead, client communication, scope creep, bid, invoice, revision

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 12.6 - Irrigation (J1/J2)

Big Idea(s):

- Irrigation systems must be designed and installed to ensure proper plant health, water conservation, and environmental compliance
- Licensing and regulations are critical to the responsible implementation of irrigation work
- Understanding irrigation system components and hydraulics is key to effective troubleshooting and repair

Essential Question(s):

- How does proper irrigation system design support healthy plant growth and water efficiency?
- What are the licensing requirements and responsibilities for irrigation professionals in Connecticut?
- How do you install, test, and maintain a basic residential or commercial irrigation system?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.6.1 Fundamentals of Irrigation	• **Describe the purpose and benefits of irrigation systems in landscape design** • **Identify types of irrigation systems (e.g., drip, spray, rotary)** • **Label and explain functions of system components (valves, heads, pipes, timers, etc.)**
12.6.2 Installation and Troubleshooting	• **Demonstrate proper trenching, pipe laying, and head placement** • **Use tools and materials for PVC and poly pipe systems** • **Conduct system testing and basic troubleshooting (e.g., clogs, leaks, pressure issues)** • **Apply safety practices when using trenchers and digging near utilities**
12.6.3 J1/J2 License Preparation and Regulations	• **Explain Connecticut's J1/J2 licensing requirements and career pathways** • **Describe state/local codes regarding irrigation installation and backflow prevention** • **Identify water conservation laws and responsible irrigation practices**

Technical Vocab-

Irrigation, Drip System, Sprinkler Head, Valve, Solenoid, Controller, Zone, Backflow Preventer, Trenching, PSI (Pounds per Square Inch), Flow Rate, GPM (Gallons per Minute), PVC, Poly Pipe, J1/J2 License, Water Audit, Pressure Regulator

Resources-

Connecticut Department of Consumer Protection – Irrigation Licensing Info; Landscape Design, Installation, and Management (GW)

Priority Standard 12.7 - Plants IV: Design, Production & Advanced Applications

Big Idea(s):

- Mastery of plant selection, placement, and environmental alignment supports complex projects
- Greenhouse growing and production systems enhance plant availability and health
- Students apply full-cycle understanding: from seed to installation, with documentation

Essential Question(s):

- How do we select plants for advanced projects with long-term success in mind?
- What are the design, timing, and care considerations for greenhouse and production work?
- How do professional-grade documentation and planning support career readiness?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.7.1 – Plant Selection for Design	• **Evaluate plant choices based on sunlight, soil, and hardiness zones** • **Select plants for function (e.g., screening, erosion control, aesthetics)** • **Match mature plant size to design requirements**
12.7.2 – Production Planning	• **Create propagation schedules based on project deadlines** • **Track plant growth for readiness and optimal transplant timing** • **Calculate quantity needs for large-scale installations**
12.7.3 – Greenhouse & Container Systems	• **Operate and maintain greenhouse structures** • **Monitor climate controls (temperature, humidity, light exposure)** • **Evaluate plant growth in containerized systems and adjust inputs**
12.7.4 – Professional Plant Selection and ID Tools	• **Evaluate a plant palette for a full-site design, including softscape and functional elements** • **Use landscape software, plant databases, and/or supplier catalogs to match species with design criteria** • **Refine species selections based on sustainability, client preferences, and**

Students will know:	*As evidenced by: (oral, written, or performance)*
	regulatory/environmental restrictions
12.7.5 – Project Documentation & Planning	• **Develop planting plans with species, spacing, and sequencing** • **Estimate labor and materials for plant installations** • **Document each phase using sketches, reports, and digital tools**

Technical Vocab-

Erosion control, hardiness zone, greenhouse, propagation schedule, containerized plant, climate control, planting plan, photosensitivity, nutrient deficiency, transplant shock

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 12.8 - Greenhouse Growing Practices

Big Idea(s):

- Controlled environments in greenhouses allow for year-round plant production and experimentation
- Successful greenhouse management requires understanding of climate control, propagation, sanitation, and scheduling
- Greenhouse systems support food production, ornamental plant cultivation, and career pathways in horticulture

Essential Question(s):

- How do environmental controls in a greenhouse impact plant growth and health?
- What propagation methods are commonly used in greenhouse settings?
- What skills and knowledge are required to operate and maintain a productive greenhouse?
- How can greenhouse operations be optimized for sustainability and profitability?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.8.1 – Greenhouse Structures and Systems	• **Identify components of a greenhouse structure (e.g., glazing, framing, benches)** • **Describe the functions of heating, cooling, ventilation, and irrigation systems** • **Monitor and adjust temperature, humidity, and light to meet plant needs** • **Explain the role of automation and sensors in climate control**
12.8.2 – Plant Propagation and Growing Techniques	• **Demonstrate propagation techniques: seed starting, cuttings, and division** • **Mix and handle growing media appropriate to different plant types** • **Transplant seedlings and monitor early growth stages** • **Identify common greenhouse crops (ornamental and edible)**
12.8.3 – Maintenance, Sanitation, and Scheduling	• **Develop and follow a greenhouse sanitation protocol to reduce pest/disease risks** • **Maintain tools and equipment (e.g., misters, lights, heating units)**

Students will know:	*As evidenced by: (oral, written, or performance)*
	• **Create a basic greenhouse crop schedule (from propagation to market)** • **Track plant care routines using digital or paper-based logs**
12.8.4 – Sustainability and Commercial Applications	• **Explain sustainable practices in greenhouse production (e.g., water reuse, organic inputs)** • **Explore career and entrepreneurial opportunities in greenhouse growing** • **Identify local/regional markets for greenhouse products** • **Describe energy efficiency strategies in greenhouse operations**

Technical Vocab-

Greenhouse, Glazing, Humidity, Thermostat, Propagation, Germination, Cutting, Transplanting, Growing Media, Fertigation, Photosynthesis, Ventilation, Crop Scheduling, Sanitation Protocol, Sustainability, IPM (Integrated Pest Management), Automation, Shade Cloth, Evaporative Cooling

Resources-

Landscape Design, Installation, and Management (GW)

Priority Standard 12.9 - Professional Practice in Landscaping

Big Idea(s):

- Professional and technical skills are demonstrated through the process and product of hands-on landscaping work
- Landscape design and installation projects provide opportunities to apply core competencies in real-world outdoor environments
- Employability attributes such as communication, problem-solving, and professionalism are critical to success in the green industry
- Reflection and portfolio documentation are essential for tracking growth and preparing for career opportunities

Essential Question(s):

- How do professional behaviors and employability skills impact success in landscaping?
- What landscape practices lead to high-quality workmanship?
- How can reflecting on our work help us improve and prepare for future opportunities?
- Why is documenting work experiences important for career readiness?

Learning Outcomes

Students will know:	*As evidenced by: (oral, written, or performance)*
12.9.1 Professionalism and Employability	• **Identify work-ready skills that reflect professionalism on a jobsite or in a workshop** • **Describe how attributes of the CTECS Vision of a Graduate relate to the construction industry** • **Demonstrate respectful behavior, effective communication, social skills, and work readiness while working in team and individual settings** • **Apply critical thinking and problem-solving skills to complete tasks and resolve challenges in a professional setting**

12.9.2 Technical Skills	• **Apply core landscaping skills including:**
	  ○ **Measuring and layout**
	  ○ **Tool selection and use**
	  ○ **Plant and turf installation and maintenance**
	  ○ **Hardscape installation techniques**

Students will know:	*As evidenced by: (oral, written, or performance)*
	○ **Basic small engine inspection, maintenance, and repair** ● **Demonstrate safe and appropriate practices related to:** ○ **Personal Protective Equipment (PPE) and environmental awareness** ○ **Operation and maintenance of landscape equipment** ○ **Proper lifting, loading, and handling techniques** ○ **Safe use of hand and power tools for outdoor work** ● **Evaluate quality of work based on project specifications and industry standards** ● **Follow organized processes to complete tasks efficiently and accurately**

Technical Vocab-

Workmanship, competency, portfolio, resume, reflection, jobsite, professionalism, proficiency.

Resources-

Landscape Design, Installation, and Management (GW)