

Unit 6: Maintaining Tools and Equipment

Content Area: **CTE**
Course(s): **Horticulture III**
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Unit Overview

Many power tools are used in the landscape industry. These power tools greatly increase the efficiency of the work. Power tools may be electric motor powered or gasoline engine powered.

Turfgrass requires more maintenance than any other element of a landscape. Power tools and equipment, such as mowers, string trimmers, edgers, leaf blowers, aerators, dethatchers, spreaders, and sprayers, are widely used to maintain turf.

The two fundamentals for managing small engines are to operate the equipment as it was designed to be operated and to follow recommended maintenance procedures.

Preventive maintenance is the use of periodic practices to keep equipment in good working order.

By performing preventive maintenance, the owner tries to prevent costly repairs and downtime.

Enduring Understandings

Early humans created hand tools from stone, metal, and wood to simplify their work. Hand tools make tasks much easier to accomplish. Learning to choose the right tool for the job and to use it correctly reduces frustration and increases the work that can be done. A starting point is to learn to identify the tools that will be helpful in horticulture.

Essential Questions

- What are some common types of turf maintenance equipment and how are they used?
- What digging and grading hand tools are available and how are they used?
- When should small engine maintenance jobs be performed?

Lesson Titles

- Maintaining Small Engines
- Using Hand Tools in Landscaping
- Using large Landscape Maintenance Equipment
- Using Power Tools and Small Landscape Maintenance Equipment

Standards/Indicators/Student Learning Objectives (SLOs)

- Identify and describe common types of turf maintenance equipment
- Identify and describe common landscape installation and maintenance tools and equipment
- Discuss the proper maintenance of power tools and equipment
- Describe equipment maintenance schedules
- Explain how to service intake/exhaust and fuel systems
- Discuss the maintenance of cooling and lubrication systems
- Discuss the servicing of compression and ignition systems
- Explain how to prepare equipment for storage

9.3.12.AG	Agriculture, Food & Natural Resources
9.3.12.AG.1	Analyze how issues, trends, technologies and public policies impact systems in the Agriculture, Food & Natural Resources Career Cluster.
9.3.12.AG.2	Evaluate the nature and scope of the Agriculture, Food & Natural Resources Career Cluster and the role of agriculture, food and natural resources (AFNR) in society and the economy.
9.3.12.AG.3	Examine and summarize the importance of health, safety and environmental management systems in AFNR businesses.
9.3.12.AG.6	Analyze the interaction among AFNR systems in the production, processing and management of food, fiber and fuel and the sustainable use of natural resources.
9.3.12.AG-BIZ	Agribusiness Systems
9.3.12.AG-BIZ.4	Develop a business plan for an AFNR business.
9.3.12.AG-BIZ.5	Use sales and marketing principles to accomplish AFNR business objectives.
9.3.12.AG-ENV.1	Use analytical procedures and instruments to manage environmental service systems.
CAEP.9.2.12.C	Career Preparation
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.

CAEP.9.2.12.C.5	Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.
CAEP.9.2.12.C.6	Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.12.CI	Creativity and Innovation
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.9.4.12.CI.2	Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3). With a growth mindset, failure is an important part of success. Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed. Innovative ideas or innovation can lead to career opportunities.

Inter-Disciplinary Connections

<ul style="list-style-type: none"> 10. English Language Arts 10.8.12. Science and Technical Subjects: 9-12 10.8.12.SC12. Science and Technical Subjects: 11-12 10.8.12.SC12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RH.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem. RST.11-12.1. Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. 	
LA.11-12.CCSS.ELA-Literacy.R.11-12	Reading
SCI.9-12.5.1.12	All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.
SCI.9-12.5.1.12.A	Students understand core concepts and principles of science and use measurement and

observation tools to assist in categorizing, representing, and interpreting the natural and designed world.

SCI.9-12.5.1.12.A.a

Mathematical, physical, and computational tools are used to search for and explain core scientific concepts and principles.

TECH.8.1.12.A

Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.

Equity Considerations

LGBTQ and Disabilities Mandate

Topic: Helping people with disabilities succeed in agriculture

Materials Used: <https://www.usda.gov/media/blog/2017/10/10/agrability-helps-ag-workers-disabilities-succeed>

Addresses the Following Component of the Mandate:

- Economic
- Political
- Social

Holocaust Mandate

Topic: How a black farm is fighting discrimination and climate change

Materials Used: <https://www.washingtonpost.com/climate-environment/climate-solutions/interactive/2021/harvest-world-black-family-farm-is-fighting-racism-agriculture-climate-change/>

Addresses the Following Component of the Mandate:

- Bias
- Bigotry

- Bullying
- Holocaust studies
- Prejudice

Asian American Pacific Islander Mandate

Topic: Important AAPI in Landscape agriculture

Materials Used: <https://www.agdaily.com/features/important-asian-americans-and-pacific-islanders-in-agriculture/>

Addresses the Following Component of the Mandate:

- Economic
- Political
- Social

Climate Change

Topic: How a farmers combat racism and climate change

Materials Used: <https://www.washingtonpost.com/climate-environment/climate-solutions/interactive/2021/harvest-world-black-family-farm-is-fighting-racism-agriculture-climate-change/>

Addresses the Following Component of the Mandate:

- Economic
- Political
- Social

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK

REMEMBERING: defining words, identifying shifts in movements

UNDERSTANDING: explaining point of view, distinguishing between subjective and objective rhetoric, paraphrasing excerpts,

ANALYZING: close readings and synthesis of texts

EVALUATING: credibility, historical accuracy, inferencing

- Identify parts of weed wacker and maintenance of weeder
- Group Discussion
- Identify parts of a mower and maintenance of mower
- Operate and maintain leaf blower
- Students will engage in discussion and instruction via, PPT
- Teacher Guided Activitly
- Video presentations

Modifications

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ELL Modifications

- Choice of test format (multiple-choice, essay, true-false)
- Continue practicing vocabulary
- Provide study guides prior to tests
- Read directions to the student
- Read test passages aloud (for comprehension assessment)
- Vary test formats

504 and IEP Accommodations & Modifications

- Allow for redos/retakes .
- Assign fewer problems at one time (e.g., assign only odds or evens) .
- Differentiated center-based small group instruction .
- Extra time on assessments .
- Highlight key directions .
- If a manipulative is used during instruction, allow its use on a test .
- Opportunities for cooperative partner work .
- Provide reteach pages if necessary .
- Provide several ways to solve a problem if possible .

- Provide visual aids and anchor charts .
- Test in alternative site .
- Tiered lessons and assignments .
- Use of a graphic organizer .
- Use of concrete materials and objects (manipulatives) .
- Use of word processor .

Gifted and Talented Modifications

- Alternate assignments/enrichment assignments
- Enrichment projects
- Extension activities
- Higher-level cooperative learning activities
- Pairing direct instruction with coaching to promote self-directed learning
- Provide higher-order questioning and discussion opportunities
- Provide texts at a higher reading level
- Tiered assignments
- Tiered centers

At Risk

- Additional time for assignments
- Adjusted assignment timelines
- Agenda book and checklists
- Answers to be dictated
- Assistance in maintaining uncluttered space
- Books on tape
- Concrete examples
- Extra visual and verbal cues and prompts
- Follow a routine/schedule
- Graphic organizers
- Have students restate information
- No penalty for spelling errors or sloppy handwriting
- Peer or scribe note-taking
- Personalized examples
- Preferential seating
- Provision of notes or outlines
- Reduction of distractions
- Review of directions

- Review sessions
- Space for movement or breaks
- Support auditory presentations with visuals
- Teach time management skills
- Use of a study carrel
- Use of mnemonics
- Varied reinforcement procedures
- Work in progress check

Formative Assessment

- Class Discussion
- Group Work
- Guided Practice
- Oral Response
- Performance Assessment
- Teacher Observation
- Warm up

Summative Assessment

- Marking Period Assessment
- Performance Assessment
- Unit Assessments

Benchmark Assessment

Benchmark Assessments:
Skills-based assessment
Reading response
Writing prompt
Lab practical

Alternative Assessment

Alternative assessments:
Performance tasks
Project-based assignments
Problem-based assignments
Presentations
Reflective pieces
Concept maps
Case-based scenarios
Portfolios

Resources & Materials

- Teacher's Supplemental Website
- Unit Specific Power Point Presentation
- United Streaming (Related Videos)

Technology

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A	Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
TECH.8.1.12.A.1	Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.
TECH.8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
TECH.8.1.12.A.4	Construct a spreadsheet workbook with multiple worksheets, rename tabs to reflect the data on the worksheet, and use mathematical or logical functions, charts and data from all worksheets to convey the results.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.