

Forestry

Contest Description and Rules

Please Direct Questions to:

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This FFA Forestry CDE Regional Test serves as qualifying for the Wisconsin State CDE.

We recommend that you use the [Forestry Study Resources](#) found at the [Wisconsin Agricultural Education](#) website.

This Year's FFA Forestry Theme is: Innovations in Forest products

Goal: Become familiar with the innovative advances in Forest Products and technology that will open up new markets and help create new demand for timber and reinvigorate the forest industry of Wisconsin.

[Forest products are a large economic sector in Wisconsin.](#) Ultimately, a healthy forest products industry benefits both society and forests. While it may seem counter-intuitive that forests benefit from timber harvests, there are a myriad of benefits. Actively managed forests are less prone to catastrophic wildfires, can be more easily monitored for invasive species, stimulate new growth, are important to a diversity of wildlife, and sequester carbon. Many forest products store carbon for long periods, which helps to mitigate human-caused climate change.

Did you know that the USDA Forest Service Forest Products Lab is located in Madison, Wisconsin? [Into the Outdoors recently featured the lab on an episode!](#) You should watch it to help you prepare for the CDE.

Students should learn about FOREST INNOVATIONS to prepare for the Forestry CDE:

Including but not limited to:

1. Oriented strand board (OSB)
2. Cross-laminated timber (CLT)
3. Nanocellulose - [Into the Outdoors short feature](#) (located under the full Forest Products Lab video)
4. Transparent wood
5. Lignin-based carbon fibers
6. Transparent papers for food packaging
7. Genetically modified trees
8. Aerial drones

- 9. Satellites
- 10. Artificial intelligence

Additionally, in preparing and competing in this event, students will develop the skills and knowledge needed to:

- Identify the defining characteristics of a tree
- Explain the function of the parts of the tree (roots, trunk, leaves, wood, cambium, phloem, xylem, bark)
- Identify by common name the following tree and shrub species by bark, leaves, and branching pattern including but not limited to:
 - Ash
 - Balsam Fir
 - Basswood
 - Bigtooth Aspen
 - Black Locust
 - Black Spruce
 - Black walnut
 - Boxelder
 - Bur Oak
 - Butternut
 - Eastern Cottonwood
 - Eastern Hemlock
 - American Elm
 - Hazelnut
 - Jack Pine
 - Paper/white Birch
 - Quacking Aspen
 - Red Maple
 - Northern Red Oak
 - Red Pine
 - Red-osier dogwood
 - Scotch Pine
 - Silver Maple
 - Sugar Maple
 - American Sycamore
 - Tamarack/Eastern Larch
 - White Oak
 - Eastern White Pine
 - White Spruce
 - Willow sp.
 - Norway Maple
 - Honey Locust
 - Norway Spruce
 - Catalpa
 - Ginko
 - Tulip Poplar
 - Colorado Blue Spruce
- Measure a tree's dbh using a Biltmore stick and diameter tape
- Calculate a stand's Basal area.
- Be able to calculate basal area of a stand using a 10 BAF prism.
- Measure a tree's merchantable and total height using both a Merritt hypsometer and a clinometer/surveying tape.
- Use dbh and merchantable height to determine board foot and pulpwood volume using respective volume tables
- Establish a plot of a given size and inventory the trees within that plot
- Determine direction (bearing) between two points using a compass
- Determine distance by pacing between two points
- Calculate acreage from given dimensions of land
- Determine number of trees to be planted in a given area of land provided the planting density
- Calculate the cost of planting trees provided the cost per tree
- Explain the impacts of invasive species on forests

- Provide characteristics of early and late succession tree species
- Describe and differentiate common management practices of selection (single tree and group) harvest, clear cutting, planting, shelterwood harvest, seed tree harvest, prescribed burning.
- Describe common products made from Wisconsin trees.
- Identify wood characteristics of common Wisconsin trees (above).
- Select appropriate management options to meet landowner goals.
- Describe common Wisconsin tree pests and diseases (gypsy moth, forest tent caterpillar, jack pine bud worm, emerald ash borer, oak wilt, Dutch elm disease)
- Describe important forest ecological processes and characteristics of nutrient cycle, water cycle, succession, disturbance, energy flow, and biodiversity.
- Describe the effects of fire on a forest.
- Describe the common threats to an urban tree.
- Describe the benefits of an urban forest and an urban tree.
- Identify land ownership patterns in Wisconsin.
- Identify agencies and organizations involved with Wisconsin's forests.
- Describe the Managed Forest Law.

- Define the following forestry-related terms including but not limited to:
 - Allelopathy
 - Forest certification
 - Rotation
 - Board Foot
 - GIS
 - Basal Area
 - Broadleaf
 - GPS
 - Stumpage
 - Conifer
 - Harvest
 - Succession
 - Cord
 - High-grading
 - Sustainable Forestry
 - DBH
 - Infiltration
 - Transpiration
 - Deciduous
 - Invasive Species
 - Urban Forestry
 - Disturbance
 - Photosynthesis
 - Vegetative Reproduction
 - Ecosystem
 - Riparian Zone
 - Veneer
 - Evergreen
 - Root Girdle
 - Windbreak

- Be able to identify and describe the use of the following forest related tools including but not limited to:
 - Adz
 - Angle gauge
 - Backpack
 - Sprayer
 - Basal area
 - Prism
 - Cant hook
 - Chain saw
 - Safety features
 - Clinometer
 - Diameter tape
 - Loggers tape
 - Safety Chaps
 - Tree borer
 - Tree scale stick
 - Wedge
 - Compass
 - Hypsometer

Event Format

The contest is organized into 2 exams: a written exam conducted inside and a field exam conducted outside. **The contest will be conducted regardless of weather.** Dress appropriately. Contestants are advised to bring jackets, rain gear and adequate footwear.

All written materials will be provided, as well as forest measurement tools other than those listed below.

Contestants must provide their own:

- Clipboards
- No. 2 pencils (no pens, please)
- Calculators*
- One Silva Ranger compass or one of comparable quality*

*To prevent the possibility of inadvertent answer sharing (e.g. not clearing out calculators, not resetting compass bearings, etc.) we will not allow sharing of these tools. Phones are not allowed to be used on the exam.

There are a limited number of compasses and calculators that UWRF can lend if individuals cannot provide their own.

Indoor Written Exam

General Knowledge and Forest Business Management: Format of the exam will be mostly multiple choice, but there could also be true/false, and short answer. Individuals should be prepared to answer questions related to the objectives of the event listed above.

Expect questions that will require knowledge of forestry-related calculations such as per-acre, per-total area, and per-event values based on typical forestry measurements (e.g., total board feet, seedling survivability, total planting cost per acre, basal area, etc.).

Expect questions about tree ID, equipment ID, and forestry health/disorders ID. Tree identification will focus primarily on the Wisconsin-specific tree identification list, posted online. Forestry health/disorders will focus on a Wisconsin-revised list. Both are modeled from the National CDE Handbook.

Field Exam

Each individuals will be asked to conduct an inventory of a forest plot. This section of the exam may include some or all of the following skills: establishing a plot of given area or radius, compass and pace, tree identification, tree measurement [DBH, merchantable

height, board foot or cord volume]. The “objectives” section above includes other skills that may be included in this section of the exam.

Students should know how to use the following tools: magnetic compass, prism or angle gauge, cruising stick or Biltmore stick with hypsometer, DBH tape, clinometer all with the purpose of measuring and calculating basal area and volume of wood in a stand of trees.

The merchantable height hypsometer measurement will be to the nearest 1/2 log (8 feet) for saw log and nearest stick for pulpwood. Volume tables will be provided for both saw timber and pulpwood.

Some questions may include photos, identification materials, and math problems. All questions will be multiple choice.

Answer will need to be recorded on the scantron or provided answer sheet.

Scoring: Individual’s scores will be compiled to determine team or group scores. Tiebreakers will be built into the exam.

Tie breaker:

1. In the case of ties, the field portion of this exam will be used to break the tie.
2. If a tie continues to exist, it shall be broken by using the identification section, then general knowledge section until the tie is broken.
3. If a tie exists after the above 2 criteria are met, the word-find will be used to break the tie.

The following minimum diameters will be in effect:

| | Pulpwood | Timber |
|---------------------|-----------------|------------------|
| DBH | 5 inches | 12 inches |
| Top Diameter | 4 inches | 8 inches |

Suggested References

General knowledge

[Wisconsin FFA Forestry website](#)

[UW River Falls Forestry](#)

[Frequently Asked Questions](#) about Wisconsin 's Forests (from the Wisconsin Forestry website)

[Wisconsin's Council on Forestry](#)

Tree Identification

[LEAF Tree Identification Key](#)

[Twig identification photographs](#)

Forestry Tools

[Forestry Suppliers](#) [Forestry, Firefighting, and Tree Planting Equipment and Tools](#)

Compass Course

Navigation with Map and Compass (from Geocities Outdoor Recreation Resources Directory) www.geocities.com/Yosemite/Falls/9200/navigation_map_compass.html

Forest Management and Measurements

Bring on the Biltmore (from Purdue University) www.agriculture.purdue.edu/fnr/stoutwoods/act_biltmore.html

[Forest Fact Publications](#)

No. 38 “ What Will a Forest Tree Earn?”

No. 39 “ What's a Forest Tree Worth?”

No. 42 “ What is a Board Foot?”

No. 43 “ What is Basal Area?”

No. 44 “ What is a Cord?”

A Guide to the Tree and Log Scale Stick

http://www.forestry-suppliers.com/t01_pages/pdfs/1211_ScaleStick.pdf

Quizlet:

[Forestry Equipment Flashcards](#)

[Forestry Leaf ID Flashcards](#)

[Forestry Tree and Twig Flashcards](#)