



ENVIRONMENT AND NATURAL RESOURCES

Revised: 7 March 2025

ASSOCIATE SUPERINTENDENT CONTACT INFORMATION

Dr. Jason McKibben
Assistant Professor of Agricultural Education
Auburn University, Auburn, AL.
Telephone, 334.844.4464.
Email: jdm0184@auburn.edu

PURPOSE

The Environment and Natural Resources skill activity aims to assess students' abilities in areas such as water quality, sustainable agricultural practices, soil and water conservation, surveying, and biological waste handling.

Participants in this activity will engage with concepts and equipment related to soil and water conservation engineering. Students should be familiar with surveying tools, irrigation systems, water pumping equipment, legal land descriptions, water testing kits, and principles of soil and water conservation engineering.

GENERAL INFORMATION

- All students must wear safety glasses during the skill activities. To enter the CDE area, **students must have safety glasses** in their possession.
- **No iPad, tablet and cell phone devices** will be allowed in the contest area. The activity may involve problem solving and calculations. A calculator is highly recommended.
- Participants in this activity will be expected to work with compact engines so that the engines operate optimally. Students might be asked to complete an activity that includes one or more of the following skills.

Possible activities for the 2024 event

- Interpreting legal land description.
 - Using both meets and bounds and/or Township and Range.
- Using basic (analog) surveying equipment to measure. (Tapes/chains/wheel, Compasses, Level/Transit (dumpy, auto, etc.), tripod, Leveling Rod, Pins, field book/notes, etc...)
 - Determining location from a known point (i.e. benchmark, given location, etc...).
 - Leveling using basic (analog) equipment.

COMPETENCIES

- Interpret legal land descriptions and determine land area.
- Conduct land surveying practices.
- Lay out grade stakes for cuts/fills.

AGRICULTURE, FOOD AND NATURAL RESOURCES CONTENT STANDARDS

- ESS.01.01.01.c. Collect and prepare sample measurements using appropriate data collection techniques.
- ESS.05.01.01.b. Apply surveying and mapping principles to a situation involving environmental service systems and identify and explain the use of equipment for surveying and mapping.
- ESS.05.01.01.c. Demonstrate surveying and cartographic skills to make site measurements in order to address concerns and needs within an environmental service system situation
- NRS.03.02.01.b. Apply cartographic skills and tools (e.g., land surveys, geographic coordinate systems, etc.) to locate natural resources.

- NRS.03.02.01.c. Evaluate the availability of and threats to natural resources using cartographic skills (e.g., spread of invasive species, movement of wildlife populations, changes to biodiversity of edge of habitat versus interior, etc.).

SUGGESTED RESOURCES

In addition to the general references specified for the Agricultural Technology and Mechanical Systems CDE, the following references are suggested for the Compact Equipment Skill Activity. Note: Specific references are listed below, but others may be added at a later date and remember:

Please review the general references for the CDE.

- Herren, R. V. (2010). *Agricultural Mechanics: Fundamentals & Applications*, (6th or 7th ed.) Clifton, Park NY: Delmar.
- General soils book:
- Brady, N. & Weil, R. (2004). *Elements of the Nature and Property of Soils*. Prentice Hall.

Please review these references as well for the CDE.

- Hancock, J. P., Edgar, D.W., Pate, M. L., Dyer, L. A., & Hoover, B. D. (2017). *Agricultural Mechanics and Technology Systems*. Goodheart-Willcox Company.
- <https://www.ntc.blm.gov/krc/legacy/course/940>
- <https://www.codot.gov/programs/tetp/construction-inspector-qualification/self-study-manuals/BasicSurveying.pdf>
- <https://ctt.mtu.edu/sites/default/files/flyers/Surveying%20manual.pdf>
- <http://www.agedweb.org/agmech/UofA%20Survey%20Student%20Workbook-web.pdf>
- https://www.fao.org/fishery/static/FAO_Training/FAO_Training/General/x6707e/Index.htm