

SOILS

Purpose

The purpose of this CDE is to encourage high school agriculture students to learn about the soil resource.

Objectives

Students competing in the State Soils CDE would be expected to develop skills and abilities in the following areas.

- I. To identify and evaluate characteristics of a soil profile.
- II. To evaluate surface features which influence potential use of land.
- III. To estimate the movement of air and water through the soil.
- IV. To estimate the productive capacity of soil.
- V. To recommend practices needed to conserve soil resources.
- VI. To analyze the suitability of land for agricultural and non-agricultural uses.

Crosswalk with Show Me Standards

Objectives – Students participating in the Career Development Event should be able to:		Show-Me Standards	
		Knowledge Standards (Content Areas)	Performance Standards (Goals)
1.	To identify and evaluate characteristics of a soil profile.	CA.3	1.3, 1.4, 1.6, 1.7
2.	To evaluate surface features which influence potential use of land.	MA.1, MA.2, MA.3	3.1, 3.2
3.	To estimate the movement of air and water through the soil.	SC.2, SC.4, SC.5, SC.8	4.4, 4.8
4.	To estimate the productive capacity of soil.	SS.5	
5.	To recommend practices needed to conserve soil resources.		
6.	To analyze the suitability of land for agricultural and non-agricultural uses.		

Corresponding Secondary Agriculture Curriculum			
Course and/or Curriculum:	Agricultural Science II	Unit(s):	Soil Science

Event Format

1. The Soils CDE will consist of contestants evaluating and determining management practices of four (4) soil sites selected by the superintendent and judged in advance of the event. The boundaries will be marked so that each site will have some uniformity of soil profile and surface features.
2. The most current Interpretation Help Guide will be provided to each contestant. They will not be allowed to bring their own.
3. Judging pits will be dug to a depth of no more than five (5) feet unless limited by a very rocky layer. Buckets of soil from each horizon will be provided at each judging site. In the soil pit, an area one foot wide from top to bottom of the pit will be roped off. This will be the judged area and no contestants will be allowed to manipulate this area. Markings will be provided within this area for each horizon break and the four judged horizons will be identified.
4. Yardsticks and a water supply will be provided at each judging site.
5. The following information regarding each site will be available to the contestants **and posted on a sheet at each pit site:**
 - a. Number of the site.
 - b. Boundary of the site marked by corner flags (100' x 100'). This area will be used to evaluate slope, stoniness, rockiness, landform, and drainage. The soil pit will be located within this area.
 - c. Horizons to be judged identified by inch depth where horizons start and end.
 - d. The available water capacity of the horizons which are not judged. This is to be given as AWC, this is not a calculation.
 - e. Mineralogy is to be given as either "mixed" or "kaolinite".
 - f. Slope will be determined by sight. Slope stakes will be setup 25 feet, 50 feet, or 100 feet apart. Contestants will have to determine this distance. Slope stakes will each stand the same height out of the ground; recommended at least 4 feet.
 - g. Notes: Notes are to be used only if some additional information needs to be given. Any verbal information which is given to the contestants will also be provided in written form on the pit card under "Notes".
6. Students will be rotated through the soil site at five-minute intervals with no fewer than three students in the pit at one time. A maximum of 60 minutes and a minimum 30 minutes will be spent at each site. Groups may move at the superintendent's discretion after 30 minutes provided all scorecards have been submitted to the group leader. Scansheets are to be filled out at the soil sites. They must be filled out during the competition within the allotted time for each rotation.
7. If a horizon contains a "Cr" or "R" then the rest of the questions on the horizon should be left blank.
8. Each site will be discussed by the judges at the completion of the event. Contestants, teachers, and others who may be interested are encouraged to attend.
9. Contestants should wear clothing, boots, etc., appropriate for weather conditions.
10. If an answer splits a class boundary, mark the answer that is the most limiting as the correct answer.
11. Circumstantial answers will be provided for the soil site, i.e. Rock content, mottles, and special features of a fourth horizon will be provided if there is water in the pit. This should be noted on the NOTES section of the pit signage.

Event Scoring

Events	Points
Soil Pit 1	82 points
Soil Pit 2	82 points
Soil Pit 3	82 points
Soil Pit 4	82 points
Totals	328 points

1. Judges will score each site before the CDE begins. Scoring of all items will be based on information in the Soil Science Curriculum from IML.
2. Tabulators will compare the contestants' scorecard with the official scorecard and indicate the contestants' score.
3. **Tie scores among teams in all events should be broken using the high individual team member's score.** In case the scores are tied, the scores of the second high individual on each team should be used.
4. Ties between individuals will be broken by using the highest individual pit score.

Event Rules and Regulations

1. These CDE rules take precedence over information, rules, etc. indicated in Appendix I and II of the Soil Science curriculum available from IML if a conflict exists.
2. Spatula or digging devices will be provided. No knives or other sharp objects are allowed. **Water bottles will be provided.**
3. Neither contestants nor teachers are allowed to visit the event sites prior to the event.
4. Contestants may bring a bucket to carry the following items. Contestants are allowed to bring only the following equipment to the CDE:
 - a. Clean Clipboard
 - b. Two No. 2 Pencils
 - c. Calculators may be used. In all events, only six-function, (nonprogrammable and non-graphing) models may be used. Therefore, the calculators are limited to the following keys: Plus (+); Minus (-); Multiplication (x); Division (/); Equals (=); Memory Clear/Recall (MRC); Memory Minus (M-); Memory Plus (M+); Plus / Minus (+/-); Percentage (%); Square Root ($\sqrt{\quad}$). See page 3, rule #8 of the General CDE Guidelines for an example.
 - d. Digging tool (trowel, spade, screwdriver, rock hammer or pick). Knives are not allowed.
 - e. Towel
 - f. Items needed in case of inclement weather. Clear plastic bags and other types of rain gear.
5. Contestants shall not communicate with any other contestants, in any way, while the CDE is in progress.
6. No one except contestants, judges, superintendents, and CDE assistants will be allowed to observe the event site while judging is in progress.

7. Violation of any of the above rules may result in the elimination of individuals or teams involved from the CDE.
8. A retired or former Agriculture teacher will oversee the set-up of the Soils CDE to ensure that all pits are displayed correctly with accurate information.
9. **Inclement Weather Policy:** Realizing the potential for less than ideal weather and/or pit conditions for the Soils CDE is to be expected, the following guidelines should be followed.
 - A. In preparation for the CDE, when digging the pits, it is expected that core sample from each pit be collected for use, should weather/pits deteriorate. It is preferred that core samples be at least 5 feet deep.
 - B. In the event that weather deteriorates and/or a soil pit(s) become saturated to the point where it is unsafe for students to enter the pit(s), the State CDE Coordinator will advise the State Soils CDE Superintendent to meet with the Ag Education instructors serving as Proctors for the Soils CDE. At this meeting, the group will determine how to proceed.
 - C. If pits are not to be entered, core samples will be available for viewing by the contestants. These core samples should indicate all the information indicated in Event Format, #3.. Additionally, pit cards, as indicated under Event Format, #5. will be clearly displayed. See Standardized Soils Pit Card.
 - D. Under the Notes section of the pit card, the following information should be provided if students are not to enter the pits:
 1. Structure for each horizon.
 2. Total Rock Fragments
 3. Rock Fragments
 4. Other information deemed necessary may be provided with committee consent.
 - E. Recommended list of items contestants should bring in case of inclement weather:
 1. Rubber Boots
 2. Rain coat
 3. Warm Clothing
 4. Gloves
 5. Large plastic bag to protect clipboard/scansheet

References

Soil Science Curriculum - IML, available via MCCE website:

<http://www.missouricareereducation.org/home.php>

Local county soil survey report (free). Contains detailed soil maps and descriptions, soil chemical and physical characteristics and interpretations for agricultural and urban use. County soil surveys can also be obtained through the local office of the Natural Resources Conservation Service or on the web at <http://soilsurvey.org> or <http://websoilsurvey.nrcs.usda.gov/app/>.

For further information on soil teaching aids and references, or soil judging contests, contact the superintendent.

Forms

See FORM 19 and Soils Interpretation Help Sheet (Revised 2008).