



Environmental and Natural Resources

Purpose

Environmental and natural resource education has a responsibility to educate the public and prepare students to enter careers in the environmental and natural resource industry. The purpose of the environmental and natural resource career development event is to foster student interest, promote environmental and natural resource instruction in the agricultural education curriculum, and provide recognition for those who have demonstrated skills and competencies as a result of environmental and natural resource instruction.

Event Rules

- Each team will be comprised of four members. All four scores will be used to determine the total team score.
- Under no circumstance will any participant be allowed to handle any of the items in the identification portion of the practicums. Any infraction of this rule will be sufficient to eliminate a team from the event.

Event Format

Equipment

Participants must use the tools and equipment furnished at the event. Equipment that will be provided:

- A clipboard.
- Two sharpened No. 2 pencils.
- All other tools and equipment will be furnished for the event.

Individual Activities

Objective Written Exam — (100 points)

The written exam will consist of fifty questions submitted by the event committee. Questions will come from the last five years (2018, 2019, 2021, 2022, 2023) of National Environmental and Natural Resources CDE exams.

Identification — (100 points)

Students will complete fifty items. These may include pelts, bone, actual specimens, photos, footprint casts or scat. Identification would include understanding the application of or responding to questions regarding the samples/specimens. This will include items from the following lists:

- Equipment
- Native species
- Invasive/non-native species

Annual Practicums

The following areas will be completed by each competitor.

Soil Profile —(100 points)

- Students will be furnished with a scorecard, and an interpretation guide to judge. Students will utilize information given to complete a national land judging card.

- Sample information will be given and students will utilize the information to complete all aspects of the land judging card. Example available at the end of the document.

Waste Management —(100 points)

- Participants will be presented with various scenarios (agricultural producer, neighborhood, office building, manufacturing plant, etc.,) that generates waste material creating environmental threats.
- Participants will evaluate the nature of waste output to identify plausible options for reducing the rate of waste generation, recycling or providing potential alternative uses for the waste, treating the waste or disposing of the waste.
- Participants should be able to identify at least one benefit and one deterrent for each possible option that is offered.

Scoring

Event participants are evaluated as follows:

ACTIVITY	Individual Points	Total Team Points
Written exam	100	400
Identification	100	400
Annual Practicums – 100 pts. each Soil Profile Waste Management	200	800
TOTAL POSSIBLE POINTS	400	1600

Tiebreakers

Team

1. Highest combined identification score
2. Highest practicum score
3. Highest combined exam score

Individual

1. Highest identification score
2. Highest practicum score
3. Highest exam score

References

This list of references is not intended to be all-inclusive.

Other sources may be utilized, and teachers are encouraged to make use of the very best instructional materials available. The following list contains references that may prove helpful during event preparation.

Past CDE materials and other resources are available on [FFA.org](https://www.ffa.org).

Managing Our Natural Resources. Camp and Daughtery. Delmar Publishers, Inc. 2009. Albany N.Y.

Land Judging in Oklahoma. J.H. Stiegler, 4-H Member’s Guide, Oklahoma Cooperative

Extension Service, Division of Agricultural Sciences and Natural Resources, Oklahoma State University. 4H.HPS.101., http://www.landjudging.com/2009/land_judging_manual_2009.pdf

Environmental Science: Fundamentals and Applications. Cengage learning. 2007.

Applied Environmental Science, [FFA.org/the-council/resources](https://www.ffa.org/the-council/resources)

GPS

<https://www.gps.gov/>

https://en.wikipedia.org/wiki/Spatial_reference_system

Identification List

100 POINTS

Equipment

Water Quality

- 101. refractometer
- 102. secchi disk
- 103. water meter for physical/chemical parameters (pH, conductivity and/or DO)

Aquatic

- 104. bottom dredges
- 105. fish measuring board
- 106. plankton net
- 107. seines
- 108. sieves

Wildlife

- 109. animal tags/bands
- 110. mammal traps
- 111. snake/reptile stick
- 112. radio telemetry unit

Weather

- 113. wind speed meters
- 114. barometer

Soils

- 115. abny level
- 116. push probe
- 117. soil auger
- 118. soil color book

Native Species

Wildlife

- 201. armadillo
- 202. badger
- 203. beaver
- 204. bighorn sheep
- 205. bison
- 206. black bear
- 207. blacktail deer
- 208. bobcat
- 209. chipmunk
- 210. cottontail
- 211. coyote
- 212. elk
- 213. fox squirrel
- 214. gray squirrel
- 215. gray wolf
- 216. grizzly bear
- 217. jack rabbit
- 218. mole
- 219. moose
- 220. mountain goat
- 221. mountain lion
- 222. mule deer
- 223. muskrat
- 224. opossum
- 225. pocket gopher
- 226. porcupine
- 227. prairie dog
- 228. pronghorn
- 229. raccoon
- 230. red fox
- 231. skunk
- 232. weasel
- 233. whitetail deer
- 234. woodchuck

Birds

- 301. bald eagle
- 302. blue jay
- 303. bluebird
- 304. brown thrasher
- 305. Canada goose
- 306. canvasback duck
- 307. cardinal
- 308. Cooper's hawk
- 309. Crissal thrasher
- 310. mourning dove
- 311. great blue heron
- 312. great horned owl
- 313. golden eagle
- 314. hummingbird
- 315. kestrel
- 316. least tern
- 317. mallard duck
- 318. osprey
- 319. pelican
- 320. purple martin
- 321. quail
- 322. red-tailed hawk
- 323. sand hill crane
- 324. blue-winged teal
- 325. turkey
- 326. whooping crane
- 327. wood duck

Native Species

Reptiles/Amphibians

- 401. alligator
- 402. alligator snapping turtle
- 403. black rat snake
- 404. bullfrog
- 405. collared lizard
- 406. common snapping turtle
- 407. copperhead snake
- 408. coral snake
- 409. corn snake
- 410. cottonmouth
- 411. crocodile
- 412. fence lizard
- 413. garter snake
- 414. green anole lizard
- 415. gray tree frog
- 416. rattlesnake
- 417. red eared slider
- 418. ring neck snake
- 419. rubber boa snake
- 420. scarlet king snake
- 421. Woodhouse's toad

Fish and Other Aquatic Animals

- 501. blue catfish
- 502. bream/bluegill
- 503. brown trout
- 504. carp
- 505. channel catfish
- 506. clam
- 507. crab
- 508. crappie
- 509. crayfish
- 510. flathead catfish
- 511. largemouth bass
- 512. lobster
- 513. salmon
- 514. shrimp
- 515. smallmouth bass
- 516. sturgeon
- 517. trout
- 518. walleye
- 519. yellow bullhead catfish

Invasive/Non-native species

Plants

- 601. broom snake weed
- 602. cheatgrass
- 603. Chinese tallow
- 604. cogon grass
- 605. English ivy
- 606. Himalaya blackberry
- 607. hydrilla
- 608. juniper
- 609. kudzu
- 610. leafy spurge
- 611. melaleuca
- 612. mimosa tree
- 613. purple loosestrife
- 614. Russian olive
- 615. saltcedar

Animals

- 701. Asiatic clam
- 702. Asian long-horned beetle
- 705. Chinese mitten crab
- 706. chukkar
- 707. English sparrow
- 708. European starling
- 709. feral hog
- 710. feral horse
- 711. fire ant
- 712. Gopher
- 713. Norway rat
- 714. Nutria
- 715. ring neck pheasant
- 716. sea lamprey
- 717. Tilapia
- 718. zebra mussel

Water Quality

Water Sample #	pH test	Temp test	test
1	1	2	3
2	0 0 0	0 0 0	0 0
3	1 1 1	1 1 1	1 1
4	2 2 2	2 2 2	2 2
5	3 3 3	3 3 3	3 3
6	4 4 4	4 4 4	4 4
7	5 5 5	5 5 5	5 5
8	6 6 6	6 6 6	6 6
9	7 7 7	7 7 7	7 7
10	8 8 8	8 8 8	8 8
11	9 9 9	9 9 9	9 9

Limiting Factors	test	test
1 A B C D E	4	5
2 A B C D E	0 0	0 0 0
3 A B C D E	1 1	1 1 1
4 A B C D E	2 2	2 2 2
5 A B C D E	3 3	3 3 3
6 A B C D E	4 4	4 4 4
7 A B C D E	5 5	5 5 5
8 A B C D E	6 6	6 6 6
9 A B C D E	7 7	7 7 7
10 A B C D E	8 8	8 8 8
11 A B C D E	9 9	9 9 9
12 A B C D E		
13 A B C D E		
14 A B C D E		
15 A B C D E		

Soil Profile Scorecard

100 POINTS

Name _____

Member Number _____

Chapter _____

State _____

PART 1 (60 POINTS)			
Soil Factors – Part 1 (Check Appropriate Box)		Soil Factors – Part 1 (Check Appropriate Box)	
Points		Points	
6 + 6	Texture Surface Subsurface <input type="checkbox"/> <input type="checkbox"/> 1. Coarse <input type="checkbox"/> <input type="checkbox"/> 2. Moderately Coarse <input type="checkbox"/> <input type="checkbox"/> 3. Medium <input type="checkbox"/> <input type="checkbox"/> 4. Moderately Fine <input type="checkbox"/> <input type="checkbox"/> 5. Fine	6	Permeability <input type="checkbox"/> 1. Rapid <input type="checkbox"/> 2. Moderate <input type="checkbox"/> 3. Slow <input type="checkbox"/> 4. Very Slow
6	Depth of Soil <input type="checkbox"/> 1. Deep <input type="checkbox"/> 2. Moderately Deep <input type="checkbox"/> 3. Shallow <input type="checkbox"/> 4. Very Shallow	6	Surface Runoff <input type="checkbox"/> 1. Rapid <input type="checkbox"/> 2. Moderate <input type="checkbox"/> 3. Slow <input type="checkbox"/> 4. Very Slow
6	Slope <input type="checkbox"/> 1. Nearly Level 0-1% <input type="checkbox"/> 2. Gently Sloping.....1-3% <input type="checkbox"/> 3. Moderate Sloping3-5% <input type="checkbox"/> 4. Strongly Sloping5-8% <input type="checkbox"/> 5. Steep8-15% <input type="checkbox"/> 6. Very Steep> 15%	9	Major Factors That Keep Area Out of Class 1 <input type="checkbox"/> 1. Texture <input type="checkbox"/> 2. Depth <input type="checkbox"/> 3. Slope <input type="checkbox"/> 4. Erosion <input type="checkbox"/> 5. Permeability <input type="checkbox"/> 6. Runoff <input type="checkbox"/> 7. Wetness <input type="checkbox"/> 8. Flooding <input type="checkbox"/> 9. None
6	Erosion – Wind and Water <input type="checkbox"/> 1. None to Slight <input type="checkbox"/> 2. Moderate <input type="checkbox"/> 3. Severe <input type="checkbox"/> 4. Very Severe	9	Land Capability Class <input type="checkbox"/> 1. Class I 5. Class V <input type="checkbox"/> 2. Class II 6. Class VI <input type="checkbox"/> 3. Class III 7. Class VII <input type="checkbox"/> 4. Class IV 8. Class VIII
	<i>Points</i>		<i>Points</i>
		TOTAL POINTS PART 1	

Soil Profile Scorecard

PART 2 (40 POINTS)	
Recommended Treatment – Part 1 (Check Appropriate Box)	
Points	
	<p>Vegetative</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1. Row crop/occasional soil conserving crop <input type="checkbox"/> 2. Row crop/frequent soil conserving crop <input type="checkbox"/> 3. Row crops not more than 2 out of 4 years <input type="checkbox"/> 4. Row crops not more than 1 out of 5 years <input type="checkbox"/> 5. Return crop residue to the soil <input type="checkbox"/> 6. Practice conservation tillage <input type="checkbox"/> 7. Establish recommended grass or grasses and legumes <input type="checkbox"/> 8. Proper pasture and range management <input type="checkbox"/> 9. Protect from burning <input type="checkbox"/> 10. Control grazing <input type="checkbox"/> 11. Plant recommended trees <input type="checkbox"/> 12. Harvest trees selectively <input type="checkbox"/> 13. Use only for wildlife or recreation area <p>Mechanical</p> <ul style="list-style-type: none"> <input type="checkbox"/> 14. Control brush or trees <input type="checkbox"/> 15. Terrace and farm on contour <input type="checkbox"/> 16. Maintain terraces <input type="checkbox"/> 17. Construction diversion terraces <input type="checkbox"/> 18. Install drainage system <input type="checkbox"/> 19. Control gullies <input type="checkbox"/> 20. No mechanical treatment needed <p>Fertilizer and Soil Amendments</p> <ul style="list-style-type: none"> <input type="checkbox"/> 21. Soil amendments <input type="checkbox"/> 22. Phosphorous [P] <input type="checkbox"/> 23. Potassium [K] <input type="checkbox"/> 24. Nitrogen [N] <input type="checkbox"/> 25. Fertilizer or soil amendments not needed
	<i>Total Points Part 2 (40 points possible)</i>
	<i>Total Points Part 1(60 points possible)</i>
	GRAND TOTAL POINTS – 100 (points possible)

Judge's Name

Judge's Signature

Date

Soil Profile Scorecard Example

Utilize the information below to complete the soil profile card provided. You will then utilize the information to also complete permeability, surface runoff, major factors that keep area out of class 1, land capability class, vegetative and mechanical land treatments, and fertilizer & soil amendments.

Surface Soil

Loose, very friable and the individual grains can be readily seen or felt. When squeezed between thumb and forefinger it feels gritty and will not ribbon or stain fingers.

Subsoil

Feels gritty but contains enough silt and clay to make moist soil hold together. If squeezed when moist, a mold can be formed which can be carefully handled without breaking. It forms no ribbon or very poor ribbon.

Depth of Soil

24 inches of soil can be penetrated by plant roots.

Slope

There is a 1.7-foot elevation change in 100 feet.

Erosion

Original topsoil was 8". Currently topsoil is 4".

Ph is 5.5

Phosphorus is 75

Potassium is 75

Nitrogen is deficient

Students would take the information above and complete the soil profile scorecard. www.landjudging.com will be a good resource. Go to practice, then the land cards for examples.