



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

The complete rules, policies and procedures relevant to all New Jersey FFA Career and Leadership Development Events may be found in the CDE & LDE Event Participation Policy: https://nj.gov/agriculture/ag_ed/ffa/activity/CDE_LDE_Policy.pdf

- Teams will consist of four members, and all four scores will count toward the team score.
- The team score is comprised of the combined scores of each individual and the team activity in which all team members will participate.
- Travel Official Dress is required during the event. Travel Official Dress includes boots or work shoes, black jeans or work pants, etc. as opposed to dress attire. Participants must come to the event prepared to work in adverse weather conditions. The event will be conducted regardless of weather. Participants should have rain gear, warm clothes and closed toed shoes.
- Under no circumstances will any participant be allowed to touch or handle identification items or other specimens during the event except as expressly permitted in certain practicums.
- Any communication between participants during the event will be sufficient cause to eliminate the team from the event.
- Any participant caught cheating during the event will be expelled from the event.
- Participants are NOT allowed to use (or have visible) electronic devices during the event, unless for medical reasons or a portion of the event requires usage. This includes cell phones, tablets, etc. Participants will be allowed to use calculators, if specified for that event; however, cell phone calculators and graphing calculators are not permitted! Failure to adhere to these rules will result in disqualification.
- All individuals participating will judge in a cooperative manner following the rules set forth by the event coordinator.
- No school/chapter will use Rutgers University or Delaware Valley University facilities or locations for the training of teams. Contact with University faculty and staff is permissible. **Penalty will be disqualification.**
- This event will be scored using "Scan-tron" sheets. It is important for students to listen to directions and fill out the sheets correctly in order to receive credit. Sample scan-tron sheets are available for practice on the State Activity Guide. This event uses the Environmental and Natural Resources (#712-1) scan-tron sheet.
- There will be no separate alternate teams.
- A student may not compete in more than one event during the New Jersey FFA Spring Career Development Events.
- The State level competition fee of \$11 per contestant will be paid by the competing school. If a chapter is at least blue affiliated, registration to state FFA career development events is waived.

Event Format

Equipment

Each participant must have the following items for the competition:

- A clipboard.
- Two sharpened No. 2 pencils.
- A calculator — Calculators used in this event should be battery-operated, nonprogrammable and silent with large keys and displays. Calculator functions should be limited to: addition, subtraction, multiplication, division, equals, percent, square root, +/- key and one memory register. No other calculators may be used during the event.
- Chapters will be notified if **EACH PARTICIPANT** will be responsible for bringing their own additional equipment (i.e. GPS unit, soil kit, water analysis kit) at least one month before the event. Team members are **NOT** permitted to share GPS units, soil kits, water analysis kits, etc. between teammates or among any other contestants.
 - The minimum requirements for GPS will be the Garmin eTrex receiver or compatible. Position accuracy WAAS enabled three meters, 20 routes, 500 way points (total). GPS units with any type of communication, data-sharing, or photographic capabilities are prohibited from use in the ENR CDE. This includes but is not limited to GPS units enabled with a two-way radio or wireless (e.g., cellular, Bluetooth, or satellite subscription service) capabilities.

Flow of Event

- Objective Written Exam – 30 minutes
- Identification – 30 minutes
- Practicum #1 – 30 minutes
- Practicum #2 – 30 minutes
- Team Activity – Written Statement – 30 minutes

Team Activity (200 points total)

A yearly topic will be announced at least 1 month prior to the event. Teams will be required to develop a written statement that addresses the questions in the annual scenario. Students will be provided a scenario that deals with an environmental/natural resource problem from the following areas:

Soils

- Physical properties.
- Soil erosion.
- Soil analysis.
- Soil sustainability.

Water

- Importance of water.
- Factors that influence the quality and quantity of water.
- Management practices to ensure water quality and quantity.

Ecosystems

- Basic ecological concepts.
- Management of ecosystems.

Waste management

- Preventing and reducing solid waste.
- Disposing of waste.
- Manure management.
- Hazardous waste.

Scoring of the team activity:

Teams will be required to develop a written statement that addresses the questions in the annual scenario. Teams will submit a written statement of their findings at the end of thirty minutes. (200 points)

Individual Activities

Objective Written Exam — 30 minutes (100 points)

The written exam will consist of fifty questions submitted by the event coordinator.

Identification — 30 minutes (100 points)

Students will identify fifty items. These may be pelts, bone, actual specimens, photos, footprint casts or scat from the following combined areas:

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

Annual Practicums

TWO (2) practicums will be chosen from the list below and announced on the morning of the event. – 30 MINUTES EACH

Data Interpretation —30 minutes (100 points)

- Student will be provided a survey analysis (waste, soil, air or water) and they will be expected to answer questions related to this report.

Water Analysis —30 minutes (100 points)

- Using measuring devices, each participant will measure a sample of water for quality analysis. Four of the following categories will be tested each year: dissolved oxygen, nitrates, nitrites, pH, temperature, phosphates, water hardness, chlorine and ammonia.
- Analyze the results of measurements and determine if it is suitable for a specific use.
- Answer questions using the data collected about water quality and limiting factors.

Soil Profile —30 minutes (100 points)

- Students will be furnished with a scorecard, an interpretation guide and a pre-dug soil pit or core/monolith to judge. The participants will identify soil horizons, textures, percentage coarse fragments, pH, horizon colors, slope, geologic origin, soil

permeability, irrigation suitability and soil structure types of the soil present in the given example.

- Using the information from the scorecard and interpretation guide, the student will then identify the most appropriate use for the given area and the erosion control practice that best fits the designated use for the land.

GPS Locations —30 minutes (100 points)

Participants will utilize the global positioning system (GPS) unit (one for each participant) to complete one or more of the following:

- Use GPS unit to identify coordinates of various locations utilizing various coordinate systems and datums.
- Use GPS unit to identify boundaries of a given area including calculation of land area and perimeter of boundary. (Note: Relative area/perimeter formulas may be provided by event staff.)
- Use GPS unit and topographic map to layout location of fence line, pond, drainage structure or other related facilities.
- Use a GPS unit to mark location of a path or road through a given area.
- Use GPS unit to navigate to a given set of coordinates and measure linear distance between various points.

Additionally, participants should be able to demonstrate a working knowledge of global positioning systems and their GPS receiver via written exam.

Waste Management —30 minutes (100 points)

- Participants will be presented with a scenario (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 (2 of 5 below) - 100 pts ea. a. Data interpretation b. Water analysis c. Soil profile d. GPS locations e. Waste management	200	800
Team activity		200
TOTAL POSSIBLE POINTS	400	1,800

Tiebreakers

Team

- Team Activity Score
- Total of Written Exam Score

Individual

- Written Exam
- Identification Score

Awards

Awards will be presented to individuals and the first place team based on their rankings at the CDE awards ceremony at the New Jersey State FFA Convention. Awards are sponsored by the National FFA Foundation and the New Jersey FFA Association.

The 1st place team will represent New Jersey at the National FFA Convention in October.

Team

- Plaque Sponsored by the National FFA Foundation – 1st place

Individual

- Overall Medals
 - Medals – Top three individuals
- H.O. Sampson Certificates (hands-on sections ONLY)
 - Certificate – Top five individuals

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/thecouncil/resources](https://www.ffa.org/thecouncil/resources)
- GPS
 - <https://www.gps.gov/>
 - https://en.wikipedia.org/wiki/Spatial_reference_system

Request for Reasonable Accommodations

The New Jersey FFA Association is committed to providing equal access to our events and activities for all people. Use this form to request a reasonable accommodation or assistance at least 3 weeks before any state-level events:

<https://form.jotform.com/NJFFA/accommodations-request>. A new form will need to be submitted for each event in which a reasonable accommodation is being requested. This information will be kept confidential and will be used only to process the request. Our staff will review the request upon receipt and contact the requestor with additional information. The association cannot guarantee accommodations or assistance if a form is received less than 3 weeks before an event. Accommodations being requested that require the assistance of another person (nurse, interpreter, scribe, reader, etc.) is the responsibility of the school/requestor. It is also the school/requestor's responsibility to provide any approved equipment to aid in the accommodation process, if applicable.

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

Team Activity - Written Statement

200 POINTS

Chapter Name					
Indicator	Very strong evidence of skill 5-4 points	Moderate evidence of skill 3-2 points	Weak evidence of skill 1-0 points	Weight	Total Points
Written Statement					
Overview of scenario	Begins with an impact statement or question that articulates the focus of the topic area	Begins with an impact statement or question that is vague concerning the topic area	Begins with a statement or question that is completely irrelevant to the topic area	X 4	
Presentation of key components	All factors that are impacted by problems listed in the scenario are addressed (i.e., economic impact, production factors, etc.)	Some factors that are impacted by problems listed in the scenario are addressed (i.e., economic impact, production factors, etc.)	Little or no factors that are impacted by problems listed in the scenario are addressed (i.e. economic impact, production factors, etc.)	X 10	
Solution is relevant to the scenario	All solutions connect with and support industry best practices	Some solutions connect with and support industry best practices	Solutions do not connect with and do not support industry best practices	X 10	
Statement contains accurate information	Addresses the problem at hand and conveys viable solutions. Subject knowledge is excellent. Possesses a strong knowledge-base and effectively articulates information regarding situation	Addresses the problem at hand, but solutions may not be as clear or viable. Subject knowledge is average. Possesses a good knowledge-base and for the most part, articulates information regarding situation	No specific focus on the problem. Factual errors are evident. Possesses some knowledge-base but is unable to articulate information regarding situation	X 10	
Conclusion summarizes the presentation	Provides a summary statement that provides a clear and concise overview of the topic area	Provides a summary statement that provides a vague overview of the topic area	Provides a summary statement that has little relevance to the topic area	X 4	
Spelling, and grammar/ Mechanics	No misspellings or grammatical errors.	Three or fewer misspellings and or grammatical errors.	More than three misspellings and or grammatical errors.	X 2	
				TOTAL POINTS	

Judge's Name

Judge's Signature

Date

Water Quality Analysis Scorecard

100 POINTS

Name _____

Chapter _____

Your job today is to analyze the given water sample. You will need to find the given levels of four of the following possible factors: dissolved oxygen, nitrates, nitrites, pH, temperature, phosphates, water hardness, chlorine and ammonia and the current temperature. Using this information you will indicate if the water quality is suitable for specific use and respond to questions using the data collected about water quality and its limiting factors.

Water Quality												
Water Sample #			pH test			Temp test (deg. C)			test			
			1			2			3			
1			0 0 0			0 0 0			0 0			
2			1 1 1			1 1 1			1 1			
3			2 2 2			2 2 2			2 2			
4			3 3 3			3 3 3			3 3			
5			4 4 4			4 4 4			4 4			
6			5 5 5			5 5 5			5 5			
7			6 6 6			6 6 6			6 6			
8			7 7 7			7 7 7			7 7			
9			8 8 8			8 8 8			8 8			
9			9 9 9			9 9 9			9 9			
Limiting Factors												
1 A B C D E												
2 A B C D E												
3 A B C D E												
4 A B C D E												
5 A B C D E												
6 A B C D E												
7 A B C D E												
8 A B C D E												
9 A B C D E												
10 A B C D E												
11 A B C D E												
12 A B C D E												
13 A B C D E												
14 A B C D E												
15 A B C D E												
			test		test		test					
			4		5		6					
			0 0		0 0		0 0					
			1 1		1 1		1 1					
			2 2		2 2		2 2					
			3 3		3 3		3 3					
			4 4		4 4		4 4					
			5 5		5 5		5 5					
			6 6		6 6		6 6					
			7 7		7 7		7 7					
			8 8		8 8		8 8					
			9 9		9 9		9 9					

Soil Profile Scorecard

100 POINTS

Name _____

Chapter _____

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

GPS Locations Scorecard

100 POINTS

Name _____

Member Number _____

Chapter _____

State _____

Team Number _____

List your numbers for each location point following the latitude and longitude given. Additionally, participants will demonstrate a working knowledge of global positioning systems and their GPS receiver via written exam.

Note: Variance for differential corrections are noted on condition sheet.

GPS	
GPS Test #	1 - Multiple Choice
<input type="text"/>	1 A B C D E
<input type="text"/>	2 A B C D E
<input type="text"/>	3 A B C D E
<input type="text"/>	4 A B C D E
<input type="text"/>	5 A B C D E
<input type="text"/>	6 A B C D E
<input type="text"/>	7 A B C D E
<input type="text"/>	8 A B C D E
<input type="text"/>	9 A B C D E
<input type="text"/>	10 A B C D E
<input type="text"/>	11 A B C D E
<input type="text"/>	12 A B C D E
<input type="text"/>	13 A B C D E
<input type="text"/>	14 A B C D E
<input type="text"/>	15 A B C D E

2 - LATITUDE		2 - LONGITUDE	
	N		W
0 0 0	0 0 0 0 0 0	0 0 0	0 0 0 0 0 0
1 1 1	1 1 1 1 1 1	1 1 1	1 1 1 1 1 1
2 2 2	2 2 2 2 2 2	2 2 2	2 2 2 2 2 2
3 3 3	3 3 3 3 3 3	3 3 3	3 3 3 3 3 3
4 4 4	4 4 4 4 4 4	4 4 4	4 4 4 4 4 4
5 5 5	5 5 5 5 5 5	5 5 5	5 5 5 5 5 5
6 6 6	6 6 6 6 6 6	6 6 6	6 6 6 6 6 6
7 7 7	7 7 7 7 7 7	7 7 7	7 7 7 7 7 7
8 8 8	8 8 8 8 8 8	8 8 8	8 8 8 8 8 8
9 9 9	9 9 9 9 9 9	9 9 9	9 9 9 9 9 9

3 - UTM		3 - UTM	
	E		N
0 0 0	0 0 0 0 0 0	0 0 0	0 0 0 0 0 0
1 1 1	1 1 1 1 1 1	1 1 1	1 1 1 1 1 1
2 2 2	2 2 2 2 2 2	2 2 2	2 2 2 2 2 2
3 3 3	3 3 3 3 3 3	3 3 3	3 3 3 3 3 3
4 4 4	4 4 4 4 4 4	4 4 4	4 4 4 4 4 4
5 5 5	5 5 5 5 5 5	5 5 5	5 5 5 5 5 5
6 6 6	6 6 6 6 6 6	6 6 6	6 6 6 6 6 6
7 7 7	7 7 7 7 7 7	7 7 7	7 7 7 7 7 7
8 8 8	8 8 8 8 8 8	8 8 8	8 8 8 8 8 8
9 9 9	9 9 9 9 9 9	9 9 9	9 9 9 9 9 9

4	5	6	7	8	9	10
0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1	1 1 1
2 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 2	2 2 2
3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3	3 3 3
4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4	4 4 4
5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5	5 5 5
6 6 6	6 6 6	6 6 6	6 6 6	6 6 6	6 6 6	6 6 6
7 7 7	7 7 7	7 7 7	7 7 7	7 7 7	7 7 7	7 7 7
8 8 8	8 8 8	8 8 8	8 8 8	8 8 8	8 8 8	8 8 8
9 9 9	9 9 9	9 9 9	9 9 9	9 9 9	9 9 9	9 9 9

Environmental and Natural Resources Form #712-1

Team Name _____

This sheet is for demonstration and practice only.
You must use a real scan sheet for actual competition.

Incorrect Marks Correct Mark
✓ X ● ●

Team #	Last Name	First Name
0 0 0 0	A A A A A A A A A A A A	A A A A A A A A A A
1 1 1 1	B B B B B B B B B B B B	B B B B B B B B B B
2 2 2 2	C C C C C C C C C C C C	C C C C C C C C C C
3 3 3 3	D D D D D D D D D D D D	D D D D D D D D D D
4 4 4 4	E E E E E E E E E E E E	E E E E E E E E E E
5 5 5 5	F F F F F F F F F F F F	F F F F F F F F F F
6 6 6 6	G G G G G G G G G G G G	G G G G G G G G G G
7 7 7 7	H H H H H H H H H H H H	H H H H H H H H H H
8 8 8 8	I I I I I I I I I I I I	I I I I I I I I I I
9 9 9 9	J J J J J J J J J J J J	J J J J J J J J J J
	K K K K K K K K K K K K	K K K K K K K K K K
	L L L L L L L L L L L L	L L L L L L L L L L
	M M M M M M M M M M M M	M M M M M M M M M M
	N N N N N N N N N N N N	N N N N N N N N N N
	O O O O O O O O O O O O	O O O O O O O O O O
	P P P P P P P P P P P P	P P P P P P P P P P
	Q Q Q Q Q Q Q Q Q Q Q Q	Q Q Q Q Q Q Q Q Q Q
	R R R R R R R R R R R R	R R R R R R R R R R
	S S S S S S S S S S S S	S S S S S S S S S S
	T T T T T T T T T T T T	T T T T T T T T T T
	U U U U U U U U U U U U	U U U U U U U U U U
	V V V V V V V V V V V V	V V V V V V V V V V
	W W W W W W W W W W W W	W W W W W W W W W W
	X X X X X X X X X X X X	X X X X X X X X X X
	Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y
	Z Z Z Z Z Z Z Z Z Z Z Z	Z Z Z Z Z Z Z Z Z Z

Code
0 0
1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9

Water Quality			
Water Sample #	pH test	Temp test (deg. C)	test
	1	2	3
1	0 0 0 1 1 1	0 0 0 1 1 1	0 0 1 1
2	2 2 3 3	2 2 2 3 3 3	2 2 3 3
3	4 4 5 5	4 4 4 5 5 5	4 4 5 5
4	6 6 7 7	6 6 6 7 7 7	6 6 7 7
5	8 8 9 9	8 8 8 9 9 9	8 8 9 9

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

GPS Test #	GPS			
	1 - Multiple Choice	2 - LATITUDE	2 - LONGITUDE	
1	1 A B C D E	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	
2	2 A B C D E	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	
3	3 A B C D E	2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2	
4	4 A B C D E	3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3	
5	5 A B C D E	4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4	
6	6 A B C D E	5 5 5 5 5 5 5 5	5 5 5 5 5 5 5 5	
7	7 A B C D E	6 6 6 6 6 6 6 6	6 6 6 6 6 6 6 6	
8	8 A B C D E	7 7 7 7 7 7 7 7	7 7 7 7 7 7 7 7	
9	9 A B C D E	8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8	
10	10 A B C D E	9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9	
11	11 A B C D E			
12	12 A B C D E			
13	13 A B C D E			
14	14 A B C D E			
15	15 A B C D E			

3 - UTM		3 - UTM	
E		N	
0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0
1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1
2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2
3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3	3 3 3 3 3 3 3 3
4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4	4 4 4 4 4 4 4 4
5 5 5 5 5 5 5 5	5 5 5 5 5 5 5 5	5 5 5 5 5 5 5 5	5 5 5 5 5 5 5 5
6 6 6 6 6 6 6 6	6 6 6 6 6 6 6 6	6 6 6 6 6 6 6 6	6 6 6 6 6 6 6 6
7 7 7 7 7 7 7 7	7 7 7 7 7 7 7 7	7 7 7 7 7 7 7 7	7 7 7 7 7 7 7 7
8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8	8 8 8 8 8 8 8 8
9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9	9 9 9 9 9 9 9 9

4	5	6	7	8	9	10
0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0
1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1
2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2
3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3	3 3 3 3
4 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4	4 4 4 4
5 5 5 5	5 5 5 5	5 5 5 5	5 5 5 5	5 5 5 5	5 5 5 5	5 5 5 5
6 6 6 6	6 6 6 6	6 6 6 6	6 6 6 6	6 6 6 6	6 6 6 6	6 6 6 6
7 7 7 7	7 7 7 7	7 7 7 7	7 7 7 7	7 7 7 7	7 7 7 7	7 7 7 7
8 8 8 8	8 8 8 8	8 8 8 8	8 8 8 8	8 8 8 8	8 8 8 8	8 8 8 8
9 9 9 9	9 9 9 9	9 9 9 9	9 9 9 9	9 9 9 9	9 9 9 9	9 9 9 9

Written Exam	
1 A B C D E	26 A B C D E
2 A B C D E	27 A B C D E
3 A B C D E	28 A B C D E
4 A B C D E	29 A B C D E
5 A B C D E	30 A B C D E
6 A B C D E	31 A B C D E
7 A B C D E	32 A B C D E
8 A B C D E	33 A B C D E
9 A B C D E	34 A B C D E
10 A B C D E	35 A B C D E
11 A B C D E	36 A B C D E
12 A B C D E	37 A B C D E
13 A B C D E	38 A B C D E
14 A B C D E	39 A B C D E
15 A B C D E	40 A B C D E
16 A B C D E	41 A B C D E
17 A B C D E	42 A B C D E
18 A B C D E	43 A B C D E
19 A B C D E	44 A B C D E
20 A B C D E	45 A B C D E
21 A B C D E	46 A B C D E
22 A B C D E	47 A B C D E
23 A B C D E	48 A B C D E
24 A B C D E	49 A B C D E
25 A B C D E	50 A B C D E

Data Interpretation	
1 A B C D E	11 A B C D E
2 A B C D E	12 A B C D E
3 A B C D E	13 A B C D E
4 A B C D E	14 A B C D E
5 A B C D E	15 A B C D E
6 A B C D E	16 A B C D E
7 A B C D E	17 A B C D E
8 A B C D E	18 A B C D E
9 A B C D E	19 A B C D E
10 A B C D E	20 A B C D E

