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 Louisiana FFA Career and Leadership Development Events may be found in the General CDE/LDE Rules.

- Each team will be comprised of four members. All four scores will be used to determine the total team score.
- Participants must come to the event prepared to work in adverse weather conditions. The event will be conducted regardless of the weather. Participants should have rainwear, warm clothes and appropriate footwear.
- 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.
- Participants will be assigned to group leaders who will escort them to various event-staging sites. Each participant is to stay with his or her assigned group leader throughout the event or until told to change leaders by the event superintendent.
- All written material will be furnished for the event. No written materials such as tests, problems and worksheets shall be removed from the site.

Event Format

EQUIPMENT

Equipment that will be provided:

- **Tools for practicums**

Teams must provide:

- **Global Positioning System (GPS):** 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).
- A clipboard.
- Two sharpened No. 2 pencils.

Participants must use the tools and equipment furnished at the event.

INDIVIDUAL ACTIVITIES

Objective Written Exam — 60 minutes (100 points)

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

Identification — 30 minutes (100 points)

Students will identify twenty-five items. These may be pelts, bone, actual specimens, photos, footprint casts or scatfrom the following combined areas:

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

ANNUAL PRACTICUMS

Three of the five areas will be selected for the annual practicums. The FFA office will notify all chapters upon scheduling this event which three practicums were chosen out of the five annual practicums.

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 course 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 (supplied by the team) 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

Activity	Individual Points	Total Team Points
Written exam	100	400
Identification	100	400
Annual Practicums 3 of 5 below 100 pts ea.	300	1,200
a. Data interpretation		
b. Water analysis		
c. Soil profile		
d. GPS locations		
e. Waste **m**anagement		
TOTAL POINTS	500	2,000

TIEBREAKER

Team

- Highest team activity score
- Highest practicum score
- Highest combined identification score

Individual

- Highest exam score
- Highest practicum score
- Highest identification score

Awards

Awards will be presented at the awards ceremony to individuals and/or teams based upon their rankings.

Awards are provided either through team registration fees or by potential cooperating industry sponsors as a special project of the Louisiana FFA Foundation.

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.

- For past materials and preparation documents log onto 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
- GPS, http://www.trimble.com/gps_tutorial/whygps.aspx

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. cogongrass
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

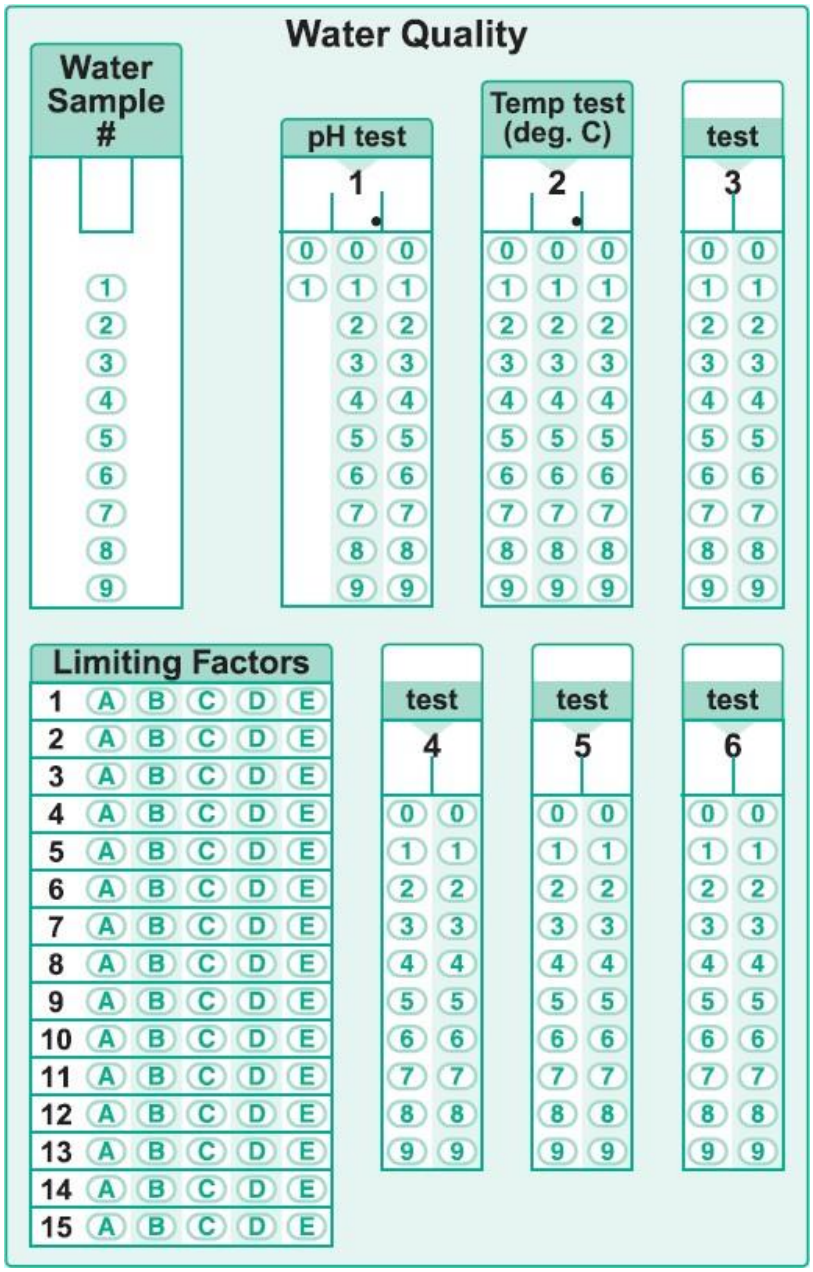
Water Quality Analysis Scorecard

100 POINTS

Name Member Number

Chapter State

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.



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	
	Texture Sur. Sub. ☐ ☐ 1. Coarse ☐ ☐ 2. Moderately Coarse ☐ ☐ 3. Medium ☐ ☐ 4. Moderately Fine ☐ ☐ 5. Fine **Depth of Soil** ☐ 1. Deep ☐ 2. Moderately Deep ☐ 3. Shallow ☐ 4. Very Shallow **Slope** ☐ 1. Nearly Level.....0-1% ☐ 2. Gently Sloping.....1-3% ☐ 3. Moderate Sloping..3-5% ☐ 4. Strongly Sloping ...5-8% ☐ 5. Steep.....8-15% ☐ 6. Very Steep.....> 15% **Erosion – Wind and Water** ☐ 1. None to Slight ☐ 2. Moderate ☐ 3. Severe ☐ 4. Very Severe		**Permeability** ☐ 1. Rapid ☐ 2. Moderate ☐ 3. Slow ☐ 4. Very Slow **Surface Runoff** ☐ 1. Rapid ☐ 2. Moderate ☐ 3. Slow ☐ 4. Very Slow **Major Factors That Keep Area Out of Class 1** ☐ 1. Texture ☐ 2. Depth ☐ 3. Slope ☐ 4. Erosion ☐ 5. Permeability ☐ 6. Runoff ☐ 7. Wetness ☐ 8. Flooding ☐ 9. None **Land Capability Class** ☐ 1. Class I ☐ 2. Class II ☐ 3. Class III ☐ 4. Class IV ☐ 5. Class V ☐ 6. Class VI ☐ 7. Class VII ☐ 8. Class VIII
	Points		*Points*
		TOTAL POINTS PART 1	

Soil Profile Scorecard

Part 2 (40 points)	
Recommended Treatment – Part 1 (Check Appropriate Box)	
Points	
	Vegetative ☐ 1. Row crop/occasional soil conserving crop ☐ 2. Row crop/frequent soil conserving crop ☐ 3. Row crops not more than 2 out of 4 years ☐ 4. Row crops not more than 1 out of 5 years ☐ 5. Return crop residue to the soil ☐ 6. Practice conservation tillage ☐ 7. Establish recommended grass or grasses and legumes ☐ 8. Proper pasture and range management ☐ 9. Protect from burning ☐ 10. Control grazing ☐ 11. Plant recommended trees ☐ 12. Harvest trees selectively ☐ 13. Use only for wildlife or recreation area **Mechanical** ☐ 14. Control brush or trees ☐ 15. Terrace and farm on contour ☐ 16. Maintain terraces ☐ 17. Construction diversion terraces ☐ 18. Install drainage system ☐ 19. Control gullies ☐ 20. No mechanical treatment needed **Fertilizer and Soil Amendments** ☐ 21. Soil amendments ☐ 22. Phosphorous [P] ☐ 23. Potassium [K] ☐ 24. Nitrogen [N] ☐ 25. Fertilizer or soil amendments not needed
	Total Points Part 2 (40 points possible)
	Total Points Part 1(60 points possible)
	GRAND TOTAL POINTS – 100 (points possible)

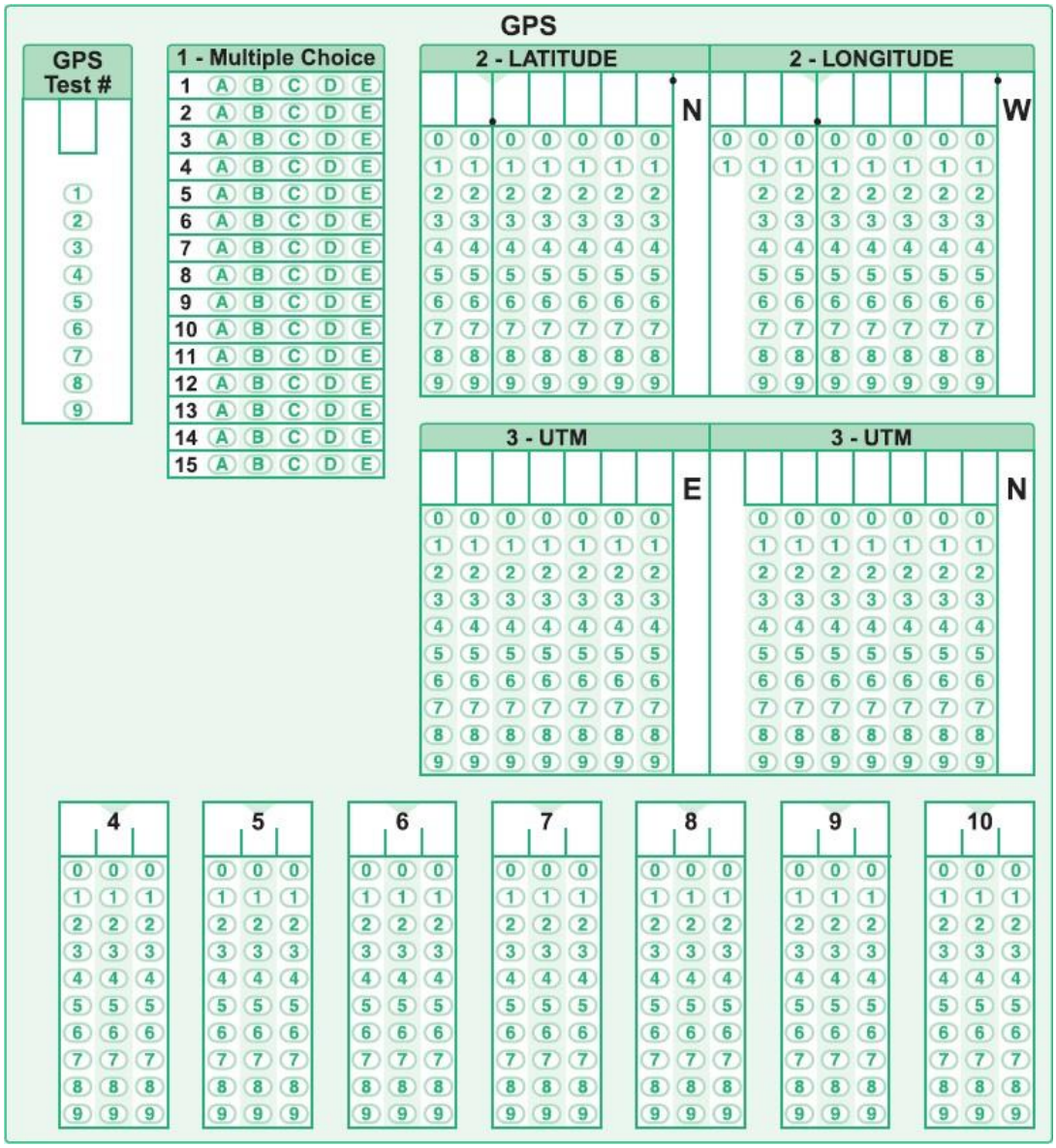
Judge's Name Judge's Signature Date

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.*



Judge's Name	Judge's Signature	Date

Agriculture, Food and Natural Resources Content Standards

Measurements Assessed	Event Activities Addressing Measurements	Related Academic Standards
AS.01.01. Performance Indicator: Evaluate the development and implications of animal origin, domestication and distribution on production practices and the environment.		
AS.01.01.01.c. Evaluate the implications of animal adaptations on production practices and the environment.	Annual practicum – waste management Team activity	HS-LS4-3
AS.01.01.02.c. Predict trends and implications of future developments within different animal industries on production practices and the environment.	Annual practicum – waste management Team activity	HS-LS4-3
AS.01.02. Performance Indicator: Assess and select animal production methods for use in animal systems based upon their effectiveness and impacts.		
AS.01.02.01.b. Analyze the impact of animal production methods on end product qualities (e.g., price, sustainability, marketing, labeling, animal welfare, etc.).	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 3
AS.01.02.04.b. Research and summarize local wildlife populations, challenges and ecological measures that are being utilized	Annual practicums – water, soil, waste management Data analysis Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 3
AS.01.02.04.c. Devise and evaluate plans to manage wildlife populations to achieve optimal ecological health.	Annual practicums – water, soil, waste management Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 1 Buying Goods and Services, Benchmarks: Grade 12, Statement 3

AS.01.03. Performance Indicator: Analyze and apply laws and sustainable practices to animal agriculture from a global perspective.		
AS.01.03.02.b. Analyze the local and global impact of sustainable animal agriculture practices on human and environmental systems.	Annual practicums – water, GPS, soil and waste management Data analysis Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 1, 4 CCSS.ELA-Literacy.W.9-10.9b CCSS.ELA-Literacy.W.11-12.9b CCSS.ELA-Literacy.RI.9-10.1 CCSS.ELA-Literacy.RI.11-12.1 HS-ETS1-1
AS.01.03.02.c. Select, evaluate and defend the use of sustainable practices in animal agriculture.	Data analysis Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 1, 4 CCSS.ELA-Literacy.W.9-10.9b CCSS.ELA-Literacy.W.11-12.9b CCSS.ELA-Literacy.RI.9-10.1 CCSS.ELA-Literacy.RI.11-12.1 HS-ETS1-1
AS.08.01. Performance Indicator: Design and implement methods to reduce the effects of animal production on the environment.		
AS.08.01.01.b. Assess methods of reducing the effects of animal agriculture on the environment.	Data analysis – soil and GPS Team activity – water and waste management Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 1 HS-LS2-6 HS-LS2-7
AS.08.01.01.c. Devise a plan that includes measures to reduce the impact of animal agriculture on the environment.	Data analysis – soil and GPS Team activity Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 1 HS-LS2-6 HS-LS2-7
AS.08.02. Performance Indicator: Evaluate the effects of environmental conditions on animals and create plans to ensure favorable environments for animals.		
AS. 08.02.01.b. Critique the reliability and validity of evidence presented to support claims regarding the effects of environmental conditions on animal populations and performance (e.g., population changes, emerging species, extinction, etc.).	Data analysis – soil and GPS Team activity – water and waste management Written exam	HS.LS4-6
AS. 08.02.01.c. Apply valid and reliable research evidence to predict the potential effects of different environmental conditions for an animal population.	Data Analysis – soil and GPS Team Activity – water and waste management Written exam	HS.LS4-6

AS.08.02.02.b. Implement and evaluate the effectiveness of methods to ensure optimal environmental conditions for animals.	Data analysis – soil and GPS Team activity – water and waste management Written exam	HS.LS4-6
AS.08.02.02.c. Devise and improve plans to establish favorable environmental conditions for animal growth and performance based on a variety of factors (e.g., economic feasibility, environmental sustainability, impact on animals, etc.).	Data analysis Written exam	HS.LS4-6
BS.01.01. Performance Indicator: Investigate and explain the relationship between past, current and emerging applications of biotechnology in agriculture (e.g., major innovators, historical developments, potential applications of biotechnology, etc.).		
BS.01.01.03.b. Analyze and document emerging problems and issues associated with agricultural biotechnology.	Team activity	CCSS.ELA-Literacy.RI.9-10.1 CCSS.ELA-Literacy.RI.11-12.1 CCSS.ELA-Literacy.RI.9-10.6 CCSS.ELA-Literacy.RI.11-12.6 CCSS.ELA-Literacy.WI.9-10.2 CCSS.ELA-Literacy.WI.11-12.2
BS.01.03.01.c. Devise and support an argument for or against an ethical issue associated with biotechnology in agriculture.	Team activity	CCSS.ELA-Literacy.RI.9-10.1 CCSS.ELA-Literacy.RI.11-12.1 CCSS.ELA-Literacy.RI.9-10.6 CCSS.ELA-Literacy.RI.11-12.6 CCSS.ELA-Literacy.WI.9-10.2 CCSS.ELA-Literacy.WI.11-12.2
BS.02.01. Performance Indicator: Read, document, evaluate and secure accurate laboratory records of experimental protocols, observations and results.		
BS.02.01.01.b. Maintain and interpret laboratory records documented in a laboratory to ensure data accuracy and integrity (e.g., avoid bias, record any conflicts of interest, avoid misinterpreted results, etc.).	Data interpretation	CCSS.ELA-Literacy.RST.9-10.1 CCSS.ELA-Literacy.RST.11-12.1 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.11-12.3
BS.02.02. Performance Indicator: Implement standard operating procedures for the proper maintenance, use and sterilization of equipment in a laboratory.		
BS.02.02.02.b. Manipulate basic laboratory equipment and measurement devices (e.g., water bath, electrophoresis equipment, micropipettes, laminar flow hood, etc.).	Water management	

BS.02.04. Performance Indicator: Safely manage and dispose of biological materials, chemicals and wastes according to standard operating procedures.		
BS.02.04.01.b. Assess the need for personal protective equipment and select the appropriate equipment to wear when working with biological and chemical materials.	Water management	CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.11-12.4
BS.02.04.03.c. Propose a management plan to reduce laboratory waste and prevent ecological or health problems related to waste disposal.	Team activity Waste management	CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.11-12.4
BS.03.01. Performance Indicator: Apply biotechnology principles, techniques and processes to create transgenic species through genetic engineering.		
BS.03.01.03.a. Analyze the benefits and risks associated with the use of biotechnology to increase productivity and improve quality of living species (e.g., plants, animals such as aquatic species, etc.).	Team activity	HS-LS3-2
BS.03.01.04.b. Analyze data to identify changes and patterns of transgenic species in the environment.	Data analysis Team activity	HS-LS3-2
BS.03.03. Performance Indicator: Apply biotechnology principles, techniques and processes to protect the environment and maximize use of natural resources (e.g., biomass, bioprospecting, industrial biotechnology, etc.).		
BS.03.03.01.b. Analyze how biotechnology can be used to monitor the effects of agricultural practices on natural populations.	Team activity	
BS.03.03.01.c. Evaluate the impact of modified organisms on the natural environment.	Team activity	
BS.03.03.03.b. Assess and document the pros and cons of bioprospecting.	Team activity	
BS.03.03.03.c. Weigh the short-term and long-term impacts of bioprospecting on the environment.	Team activity	

BS.03.04. Performance Indicator: Apply biotechnology principles, techniques and processes to enhance plant and animal care and production (e.g., selective breeding, pharmaceuticals, biodiversity, etc.).		
BS.03.04.02.b. Assess the benefits, risks and opportunities associated with using biotechnology to promote animal health.	Team activity	HS-ETS1-2 HS-LS4-6
BS.03.04.04.b. Assess whether current threats to biodiversity will have an unsustainable impact on human populations.	Team activity	HS-ETS1-2 HS-LS4-6
BS.03.05. Performance Indicator: Apply biotechnology principles, techniques and processes to produce biofuels (e.g., fermentation, transesterification, methanogenesis, etc.).		
BS.03.05.01.b. Analyze the impact of the production and use of biofuels on the environment.	Team activity	AFNR Career Cluster, Statement 5 CCSS.ELA-Literacy.RI.9-10.1 CCSS.ELA-Literacy.RI.11-12.1 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.11-12.3
BS.03.05.01.c. Evaluate and support how biofuels could solve a global issue (e.g., environmental, agricultural, etc.).	Team activity	AFNR Career Cluster, Statement 5 CCSS.ELA-Literacy.RI.9-10.1 CCSS.ELA-Literacy.RI.11-12.1 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.11-12.3
BS.03.05.05.b. Analyze and describe the process used to produce methane from biomass.	Team activity Waste management	AFNR Career Cluster, Statement 5 CCSS.ELA-Literacy.RI.9-10.1 CCSS.ELA-Literacy.RI.11-12.1 CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.11-12.3
BS.03.06. Performance Indicator: Apply biotechnology principles, techniques and processes to improve waste management (e.g., genetically modified organisms, bioremediation, etc.).		
BS.03.06.01.b. Analyze the process by which organisms are genetically engineered for waste treatment.	Team activity Waste management	
BS.03.06.02.b. Assess and describe the processes involved in biotreatment of biological wastes.	Team activity Waste management	
BS.03.06.03.b. Evaluate and describe the processes involved in biotreatment of industrial chemical wastes.	Team activity Waste management	
BS.03.06.04.b. Analyze and summarize the risks and benefits of using biotechnology for bioremediation.	Team activity Waste management	

CS.01.01. Performance Indicator: Examine issues and trends that impact AFNR systems on local, state, national and global levels.		
CS.01.01.01.b. Analyze and document AFNR issues and their impact on local, state, national and global levels.	Team activity	
CS.01.01.02.b. Analyze current trends in AFNR systems and predict their impact on local, state, national and global levels.	Team activity	
CS.01.01.02.c. Evaluate emerging trends and the opportunities they may create within the AFNR systems.	Team activity	
CS.01.02. Performance Indicator: Examine technologies and analyze their impact on AFNR systems.		
CS.01.02.01.b. Apply appropriate use of technologies in AFNR workplace scenarios.	Team activity	
CS.01.02.01.c. Solve problems in AFNR workplaces or scenarios using technology.	Team activity	
CS.01.02.02.b. Analyze how technology is used in AFNR systems to maximize productivity.	Team activity	
CS.01.02.02.c. Evaluate the importance of technology use and how it impacts AFNR systems.	Team activity	
CS.02.01. Performance Indicator: Research geographic and economic data related to AFNR systems.		
CS.02.01.01.b. Assess sets of AFNR geographic data using systems and technologies (e.g., GIS, GPS, etc.).	GPS Soil management Waste management	
CS.02.01.01.c. Evaluate geographic data and select necessary data sets to solve problems within AFNR systems.	GPS Soil management Waste management	
CS.02.02. Performance Indicator: Examine the components of the AFNR systems and their impact on the local, state, national and global society and economy.		
CS.02.02.01.b. Assess components within AFNR systems and analyze relationships between systems.	Team activity	

CS.02.02.01.c. Devise a strategy for explaining components of AFNR systems to audiences with limited knowledge.	Team activity	
CS.02.02.02.b. Assess how people within societies on local, state, national and global levels interact with AFNR systems on a daily, monthly or yearly basis.	Team activity	
CS.02.02.03.b. Assess the economic impact of an AFNR system on a local, state, national and global level.	Team activity	
CS.02.02.03.c. Evaluate how positive or negative changes in the local, state, national or global economy impacts AFNR systems.	Team activity	
CS.03.01. Performance Indicator: Identify required regulations to maintain and improve safety, health and environmental management systems.		
CS.03.01.02.b. Analyze existing required regulations within an AFNR workplace.	Data analysis Team activity	
CS.03.02. Performance Indicator: Develop a plan to maintain and improve health, safety and environmental compliance and performance.		
CS.03.02.01.c. Create a plan to improve safety, health and environmental management regulations in an AFNR business.	Team activity	AFNR Career Cluster, Statement 6
CS.03.02.02.b. Develop plans to improve environmental compliance and performance within an AFNR system.	Team Activity	AFNR Career Cluster, Statement 6
CS.03.02.02.c. Devise a strategy to educate employees on environmental compliance and performance in an AFNR business.	Team Activity	AFNR Career Cluster, Statement 6
CS.04.01. Performance Indicator: Identify and implement practices to steward natural resources in different AFNR systems.		
CS.04.01.01.b. Analyze available practices to steward natural resources in AFNR systems (e.g., wildlife and land conservation, soil and water practices, ecosystem management, etc.).	Data analysis Team activity Written exam	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Statement 3

CS.04.01.01.c. Devise strategies for stewarding natural resources at home and within community.	Data analysis Team activity Written exam	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Statement 3
CS.04.01.02.b. Analyze and assess sustainability practices that can be applied in AFNR systems (e.g., energy efficiency, recycle/reuse/repurpose, green resources, etc.).	Data analysis Team activity Written exam	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Statement 3
CS.04.01.02.c. Evaluate sustainability policies and plans and prepare summary of potential improvements for AFNR businesses or organizations.	Data analysis Team activity Written exam	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Statement 3
CS.04.02. Performance Indicator: Assess the natural resource related trends, technologies and policies that impact AFNR systems		
CS.04.02.01.b. Analyze natural resources trends and technologies and document how they impact AFNR systems (e.g., climate change, green technologies, water resources, etc.).	Data analysis Team activity Written exam	AFNR Career Cluster, Statement 7
CS.04.02.01.c. Defend or challenge natural resources trends and technologies based upon an assessment of their impact on AFNR systems.	Team activity	AFNR Career Cluster, Statement 7
CS.06.01. Performance Indicator: Explain foundational cycles and systems of AFNR.		
CS.06.01.01.b. Analyze how foundational cycles affect production, processing and management of food, fiber and fuel.	Written exam	
CS.06.01.01.c. Teach others about the impact of foundational cycles within AFNR systems.	Team activity	
CS.06.01.02.b. Analyze AFNR systems and determine their impact on producing and processing food, fiber and fuel.	Team activity	
CS.06.01.02.c. Evaluate AFNR systems and predict how the systems may change or adapt in the future of food, fiber and fuel production based on current trends and data.	Data analysis Team activity	

CS.06.02. Performance Indicator: Explain the connection and relationships between different AFNR systems on a national and global level.		
CS.06.02.01.b. Analyze differences between AFNR systems on a national and global scale.	Team activity Written exam	
CS.06.02.01.c. Evaluate how AFNR systems impact each other on a national and global level.	Team activity Written exam	
CS.06.02.02.b. Analyze the connections and relationships impacted when there is a change in an AFNR system on a national and global level.	Team activity Written exam	
CS.06.02.02.c. Evaluate how changes in one AFNR system can benefit cost components of other systems on a national and global level.	Team activity Written exam	
CRP.02.01. Performance Indicator: Use strategic thinking to connect and apply academic learning, knowledge and skills to solve problems in the workplace and community.		
CRP.02.01.01.b. Assess workplace problems and identify the most appropriate academic knowledge and skills to apply.	Data analysis Team activity	
CRP.02.01.02.b. Assess community problems and identify the most appropriate academic knowledge and skills to apply.	Team activity	
CRP.02.01.02.c. Apply academic knowledge and skills to solve problems in the community and reflect upon results achieved.	Team activity	
CRP.02.02. Performance Indicator: Use strategic thinking to connect and apply technical concepts to solve problems in the workplace and community.		
CRP.02.02.01.b. Assess workplace problems and distinguish the most appropriate technical concepts to apply.	Team activity	
CRP.02.02.01.c. Apply technical concepts to solve problems in the workplace and reflect upon the results achieved.	Team activity	

CRP.04.01. Performance Indicator: Speak using strategies that ensure clarity, logic, purpose and professionalism in formal and informal settings.		
CRP.04.01.02.b. Apply strategies for speaking with clarity, logic, purpose and professionalism in a variety of situations in formal and informal settings.	Team activity	
CRP.04.02. Performance Indicator: Produce clear, reasoned and coherent written communication in formal and informal settings.		
CRP.04.02.02.c. Compose clear and coherent written documents (e.g., agendas, audio-visuals, drafts, forms, etc.) for formal and informal settings.	Team activity	
CRP.04.03. Performance Indicator: Model active listening strategies when interacting with others in formal and informal settings.		
CRP.04.03.01.b. Apply active listening strategies (e.g., be attentive, observe non-verbal cues, ask clarifying questions, etc.).	Team activity	
CRP.04.03.02.c. Model active listening strategies in formal and informal settings.	Team activity	
CRP.05.02. Performance Indicator: Make, defend and evaluate decisions at work and in the community using information about the potential environmental, social and economic impacts.		
CRP.05.02.01.b. Apply a structured decision-making process to improve workplace and community situations.	Data analysis Team activity	
CRP.05.02.01.c. Evaluate and defend decisions applied in the workplace and community situations.	Data analysis Team activity	
CRP.05.02.02.b. Assess past decisions made in workplace and community and analyze their effects on environmental, social and economic situations.	Data analysis Team activity	
CRP.05.02.02.c. Evaluate workplace and community situations and propose decisions to be made based upon the positive impact made on environment, social and economic areas.	Data analysis Team activity	

CRP.06.01. Performance Indicator: Synthesize information, knowledge and experience to generate original ideas and challenge assumptions in the workplace and community.		
CRP.06.01.01.b. Synthesize information, knowledge and experiences to generate ideas for workplace and community situations.	Team activity	
CRP.06.03. Performance Indicator: Create and execute a plan of action to act upon new ideas and introduce innovations to workplace and community organizations.		
CRP.06.03.01.c. Design a plan of action to introduce a new idea or innovation into the workplace and community.	Team activity	
CRP.06.03.02.b. Elicit and assimilate input and feedback from individuals and organizations about new ideas or innovations for the workplace or community.	Data analysis Team activity	
CRP.07.02. Performance Indicator: Evaluate the validity of sources and data used when considering the adoption of new technologies, practices and ideas in the workplace and community.		
CRP.07.02.02.b. Assimilate data to assist in making a decision about the adoption of a new technology, practice or idea by workplaces and community organizations.	Data analysis Team activity	
CRP.07.02.02.c. Create and defend proposals for new technologies, practices and ideas using valid and reliable data sources.	Data analysis Team activity	
CRP.08.01. Performance Indicator: Apply reason and logic to evaluate workplace and community situations from multiple perspectives.		
CRP.08.01.01.b. Apply steps for critical thinking to a variety of workplace and community situations.	Team activity	
CRP.08.01.02.b. Assess solutions to workplace and community problems for evidence of reason, logic and consideration of multiple perspectives.	Team activity	

CRP.08.02. Performance Indicator: Investigate, prioritize and select solutions to solve problems in the workplace and community.		
CRP.08.02.01.b. Assimilate and prioritize potential solutions to solve problems in the workplace and community.	Team activity	
CRP.08.02.01.c. Devise strategies to evaluate the effectiveness of solutions for resolving workplace and community problems.	Team activity	
CRP.08.02.02.b. Apply decision-making processes to generate possible solutions to solve workplace and community problems.	Team activity	
CRP.08.03. Performance Indicator: Establish plans to solve workplace and community problems and execute them with resiliency.		
CRP.08.03.02.b. Create plans to solve workplace and community problems.	Team activity	
CRP.09.01. Performance Indicator: Model characteristics of ethical and effective leaders in the workplace and community (e.g. integrity, self-awareness, self-regulation, etc.).		
CRP.09.01.02.c. Model characteristics and actions of ethical and effective leaders in workplace and community situations (e.g., integrity, self-awareness, etc.).	Team activity	
CRP.09.03. Performance Indicator: Demonstrate behaviors that contribute to a positive morale and culture in the workplace and community (e.g., positively influencing others, effectively communicating, etc.).		
CRP.09.03.02.c. Model respectful and purposeful behaviors that contribute to positive morale and culture in the workplace and community (e.g., effectively communicating, recognizing accomplishments of others, etc.).	Team activity	
CRP.09.03.03b Devise, implement and evaluate strategies for continuation and improvement of respectful and purposeful behaviors that contribute to positive morale and culture in workplace and community (e.g., recognize others' skills, promote collaboration, etc.).	Team Activity	

CRP.12.02. Performance Indicator: Create and implement strategies to engage team members to work toward team and organizational goals in a variety of workplace and community situations (e.g., meetings, presentations, etc.).		
CRP.12.02.01.c. Create novel strategies to engage team members based on the situation.	Team activity	
ESS.01.01. Performance Indicator: Analyze and interpret laboratory and field samples in environmental service systems.		
ESS.01.01.01.b. Determine the appropriate sampling techniques needed to generate data.	Water analysis	CCSS.ELA-LITERACY.SL.11-12.5 CCSS.ELA-LITERACY.RST.11-12.9 CCSS.MATH.CONTENT.HSN.Q.A.1 CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3 CCSS.MATH.CONTENT.HSS.ID.A.2 CCSS.MATH.CONTENT.HSS.ID.B.5 HS-ESS2-2
ESS.01.01.01.c. Collect and prepare sample measurements using appropriate data collection techniques.	Water analysis	CCSS.ELA-LITERACY.SL.11-12.5 CCSS.ELA-LITERACY.RST.11-12.9 CCSS.MATH.CONTENT.HSN.Q.A.1 CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3 CCSS.MATH.CONTENT.HSS.ID.A.2 CCSS.MATH.CONTENT.HSS.ID.B.5 HS-ESS2-2
ESS.01.02. Performance Indicator: Properly utilize scientific instruments in environmental monitoring situations (e.g., laboratory equipment, environmental monitoring instruments, etc.).		
ESS.01.02.01.b. Demonstrate the proper use and maintenance of basic laboratory equipment.	GPS Water analysis	
ESS.01.02.01.c. Calibrate and use laboratory equipment according to standard operating procedures.	GPS Water analysis	
ESS.01.02.02.b. Demonstrate the proper use and maintenance of environmental monitoring instruments.	GPS Soils management Water analysis	
ESS.01.02.02.c. Calibrate and use environmental monitoring instruments according to standard operating procedures.	GPS Water analysis	

ESS.02.01. Performance Indicator: Interpret and evaluate the impact of laws, agencies, policies and practices affecting environmental service systems.		
ESS.02.01.02.c. Evaluate the impact and effectiveness of government agencies (i.e., local, state, and federal) associated with environmental service systems (e.g., regulation of consumption, prevention of damage to natural resources systems, management of ecological interactions, etc.).	Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Agribusiness Systems Pathway, Statement 1 AFNR Career Cluster, Natural Resources Systems Pathway, Statement 2 STEM Career Cluster, Statement 3
ESS.02.02. Performance Indicator: Compare and contrast the impact of current trends on regulation of environmental service systems (e.g., climate change, population growth, international trade, etc.).		
ESS.02.02.03.b. Analyze the correlation between increased population size and the need for regulation of environmental service systems.	Data analysis Team activity	
ESS.02.02.03.c. Predict the impact of future population growth on the regulation of environmental service systems and evaluate how changes made today will impact future regulation.	Team activity	
ESS.02.02.04.b. Assess whether current policies related to fracking and shale oil gas sufficiently address the needs of environmental service systems.	Team activity	
ESS.02.02.04.c. Evaluate current fracking policies and create suggestions for modification of these policies to more thoroughly address the needs related to environmental, economic and social sustainability.	Team activity	
ESS.02.03. Performance Indicator: Examine the impact of public perceptions and social movements on the regulation of environmental service systems.		
ESS.02.03.01.b. Analyze and summarize specific changes to perceptions and regulations of environmental service systems and their impact on reducing the ecological, economical and sociological impact.	Team activity	
ESS.02.03.01.c. Evaluate the impact of specific historical figures, or organizations, on the perception and regulation of environmental service systems.	Team activity	

ESS.03.01. Performance Indicator: Apply meteorology principles to environmental service systems.		
ESS.03.01.02.b. Analyze and articulate the relationship between meteorological conditions, air quality and air pollutants.	Data analysis	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6 HS-ESS3-5
ESS.03.01.04.b. Analyze the basics of the greenhouse effect and describe how the greenhouse effect alters the earth's balance of energy.	Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6 HS-ESS3-5
ESS.03.02. Performance Indicator: Apply soil science and hydrology principles to environmental service systems.		
ESS.03.02.01.b. Use a soil survey to determine the land capability classes for different parcels of land in an area.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.01.c. Design a master land-use management plan for a given area that utilizes land capability classes in order to minimize erosion and flooding, maximize development and preservation of topsoil, et cetera.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.02.b. Differentiate rock types and relate the chemical composition of mineral matter in soils to the parent material.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2

		CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.02.c. Evaluate the soil composition in order to predict the impact of that soil on environmental service systems.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.03.b. Assess the physical qualities of the soil that determine its potential for filtration of groundwater supplies and likelihood for flooding.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.03.c. Conduct tests of soil to determine its potential for filtration of groundwater supplies and likelihood for flooding.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.04.b. Assess precautions taken to prevent or reduce contamination of groundwater supplies.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.04.c. Evaluate the methods used in a given example to protect groundwater supplies.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1

		CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.05.b. Analyze how interactions between groundwater and surface water affect flow and availability of water.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.05.c. Construct explanations and solutions to situations involving the declining availability of water that incorporate groundwater flow equations as well as human activity.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.06.b. Analyze the importance of the roles played by wetlands in regards to water availability, prevention of flooding and other factors.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.02.06.c Evaluate and select strategies for wetlands preservation and restoration that maximize services provided by wetlands while taking human concerns into consideration.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-5 HS-ESS2-6
ESS.03.03. Performance Indicator: Apply chemistry principles to environmental service systems.		
ESS.03.03.01b. Analyze the soil chemistry of a sample.	Data analysis Soil analysis Water analysis	CCSS.ELA-LITERACY.RST.9-10.7 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2

		CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6
ESS.03.03.01.c. Evaluate a sample's soil chemistry and assess the impact on considerations in environmental service systems.	Data analysis Soil analysis Water analysis	CCSS.ELA-LITERACY.RST.9-10.7 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6
ESS.03.03.02.b. Analyze the water chemistry of a sample.	Data analysis Soil analysis Water analysis	CCSS.ELA-LITERACY.RST.9-10.7 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6
ESS.03.03.02.c. Evaluate a sample's water chemistry and assess its impact on considerations in environmental service systems.	Data analysis Soil analysis Water analysis	CCSS.ELA-LITERACY.RST.9-10.7 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6
ESS.03.03.04.b. Assess how different kinds of wetlands are formed based on the different kinds of soil and water chemistry present in each case.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.9-10.7 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6

ESS.03.03.04.c. Evaluate the services provided by types of wetlands and predict how different types of wetlands respond to pressures due to human activity.	Data analysis Soils analysis Team activity Written exam	CCSS.ELA-LITERACY.RST.9-10.7 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ESS2-6
ESS.03.04. Performance Indicator: Apply microbiology principles to environmental service systems.		
ESS.03.04.01.c. Evaluate how soil microorganisms in environmental service systems can be used to minimize waste, maximize nutrient cycling and increase ecosystem biodiversity.	Soils analysis Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSF.BF.A.1 HS-LS2-3 HS-LS3-2 HS-ET1-2
ESS.03.04.02.c. Develop strategies for negating air pollutants based on soil microbial populations (e.g., carbon sequestration and rates of decomposition).	Soils analysis Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSF.BF.A.1 HS-LS2-3 HS-LS3-2 HS-ET1-2
ESS.03.04.03.b. Assess the impact of wastewater treatment on environmental service systems.	Water analysis	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSF.BF.A.1 HS-LS2-3 HS-LS3-2 HS-ET1-2

ESS.03.04.03.c. Evaluate modern uses of microbial waste water treatment and devise strategies to further reduce the environmental, economic and social impact of wastewater treatment.	Soils analysis Team activity Water analysis	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSF.BF.A.1 HS-LS2-3 HS-LS3-2 HS-ET1-2
ESS.03.05. Performance Indicator: Apply ecology principles to environmental service systems.		
ESS.03.05.01.c. Evaluate the biodiversity of an area and predict the impact of changing the levels of biodiversity on environmental service systems.	Team sctivity	CCSS.ELA-LITERACY.RST.9-10.8 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-1 HS-LS4-4
ESS.03.05.02.b. Assess the impact of the current rate of habitat loss on environmental service systems.	Team activity	CCSS.ELA-LITERACY.RST.9-10.8 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-1 HS-LS4-4
ESS.03.05.02.c. Evaluate the importance of habitat to environmental service systems and devise strategies to minimize the future loss of habitats.	Team activity	CCSS.ELA-LITERACY.RST.9-10.8 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-1

		HS-LS4-4
ESS.03.05.03.b. Assess the impact of a population exceeding its carrying capacity on environmental service systems.	Team activity	CCSS.ELA-LITERACY.RST.9-10.8 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-1 HS-LS4-4
ESS.03.05.03.c. Devise a strategy for monitoring and supporting environmental service systems through management of a species' carrying capacity.	Team activity	CCSS.ELA-LITERACY.RST.9-10.8 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-1 HS-LS4-4
ESS.03.05.04.a. Examine how ecological interactions can be used to assess environmental service systems (i.e., macroinvertebrates and/or amphibians as bioindicators).	Team activity	CCSS.ELA-LITERACY.RST.9-10.8 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-1 HS-LS4-4
ESS.03.05.04.c. Utilize evidence from bioindicator species to detect pollutants in a given area.	Data analysis Waste management	CCSS.ELA-LITERACY.RST.9-10.8 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2

		CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-1 HS-LS4-4
ESS.04.01. Performance Indicator: Use pollution control measures to maintain a safe facility and environment.		
ESS.04.01.01.b. Assess how industrial and nonindustrial pollution has damaged the environment.	Waste management	HS-ETS1-2
ESS.04.01.01.c. Evaluate evidence for a given area for industrial and nonindustrial pollution.	Team activity Waste management	HS-ETS1-2
ESS.04.01.02.c. Create a plan for pollution remediation, management or prevention for a given area.	Team activity Waste management	HS-ETS1-2
ESS.04.01.03.a. Interpret the conditions necessary for waste to be labeled as hazardous.	Team activity Waste management	HS-ETS1-2
ESS.04.01.03.b. Classify examples of pollution as hazardous or nonhazardous.	Data analysis Waste management	HS-ETS1-2
ESS.04.01.03.c. Construct a plan for handling hazardous waste in given situations.	Team activity Waste management	HS-ETS1-2
ESS.04.02. Performance Indicator: Manage safe disposal of all categories of solid waste in environmental service systems.		
ESS.04.02.01.b. Analyze environmental hazards created by different types of solid waste, solid waste accumulation and solid waste disposal.	Waste management	HS-ETS1-2
ESS.04.02.01.c. Develop a plan for solid waste disposal for a given situation that considers the environmental hazards, economic realities and social concerns associated with this task.	Team activity Waste management	HS-ETS1-2
ESS.04.02.03.b. Apply scientific principles to explain the benefits and processes of composting.	Written exam	HS-ETS1-2
ESS.04.02.03.c. Evaluate the appropriateness of composting methods in different situations.	Team activity Waste management	HS-ETS1-2

ESS.04.02.04.b. Analyze and document different recycling methods and classify materials that can be recycled.	Data analysis	HS-ETS1-2
ESS.04.02.04.c. Survey and evaluate recycling programs and procedures.	Waste management	HS-ETS1-2
ESS.04.03. Performance Indicator: Apply techniques to ensure a safe supply of drinking water and adequate treatment of wastewater according to applicable rules and regulations.		
ESS.04.03.01.c. Evaluate samples of water and the processes necessary to ensure the samples are safe for consumption.	Waste management	HS-ETS1-2 HS-ETS1-4
ESS.04.03.02.b. Analyze and document the steps necessary to ensure that wastewater and septic waste can be safely released into the environment.	Waste management	HS-ETS1-2 HS-ETS1-4
ESS.04.03.02.c. Evaluate examples of wastewater and/or septic waste for its potential to cause environmental, economic and/or social problems.	Waste management	HS-ETS1-2 HS-ETS1-4
ESS.04.04. Performance Indicator: Compare and contrast the impact of conventional and alternative energy sources on the environment and operation of environmental service systems.		
ESS.04.04.02.b. Identify advantages and disadvantages of alternative energy sources as they pertain to environmental service systems.	Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.9 CCSS.ELA-LITERACY.WHST 11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ETS1-2 HS-ETS1-4
ESS.04.04.02.c. Evaluate the impact alternative energy sources have on environmental conditions.	Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.9 CCSS.ELA-LITERACY.WHST 11-12.9

		CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ETS1-2 HS-ETS1-4
ESS.04.04.04.c. Devise a strategy for improving future energy consumption in a manner consistent with the intents of environmental service systems.	Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.9 CCSS.ELA-LITERACY.WHST 11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ETS1-2 HS-ETS1-4
ESS.04.04.05.c. Use data from environmental monitoring to evaluate methods for reducing the imbalance in the carbon cycle through changes to energy consumption.	Data analysis	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.9 CCSS.ELA-LITERACY.WHST 11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-ETS1-2 HS-ETS1-4
ESS.05.01. Performance Indicator: Use technological and mathematical tools to map land, facilities and infrastructure for environmental service systems.		
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.	GPS	HS-ETS1-4
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 systems situation.	GPS	HS-ETS1-4
ESS.05.01.02.b. Apply GIS skills to a situation specific to environmental service systems.	GPS	HS-ETS1-4

ESS.05.01.02.c. Interpret and evaluate GIS data to come to a conclusion about a scenario specific to environmental service systems.	Data analysis Team activity Waste management	HS-ETS1-4
ESS.05.02. Performance Indicator: Perform assessments of environmental conditions using equipment, machinery and technology.		
ESS.05.02.02.b. Assess different measurements of soil quality (e.g., soil horizons, soil texture, organic matter, soil respiration, etc.) to determine their effectiveness and limitations.	Data analysis	HS-ETS1-4 HS-ETS1-2
ESS.05.02.03.b. Assess different measurements of air quality (e.g., ozone, carbon monoxide, particulate matter, etc.) to determine their effectiveness and limitations.	Data analysis	HS-ETS1-4 HS-ETS1-2
ESS.05.02.04.c. Evaluate a habitat to determine its ecological quality and if it is threatened.	Waste management	HS-ETS1-4 HS-ETS1-2
NRS.01.01. Performance Indicator: Apply methods of classification to examine natural resource availability and ecosystem function in a particular region.		
NRS.01.01.01.b. Assess the characteristics of a natural resource to determine its classification.	Written exam	AFNR Career Cluster, Statement 1 AFNR Career Cluster, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9
NRS.01.01.01.c. Devise strategies for the preservation of natural resources based on their classification.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9

NRS.01.01.02.b. Analyze the interdependence of organisms within an ecosystem (e.g., food webs, niches, impact of keystone species, etc.) and assess the dependence of organisms on nonliving components (climate, geography, energy flow, nutrient cycling, etc.).	Written exam	AFNR Career Cluster, Statement 1 AFNR Career Cluster, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9
NRS.01.01.02.c. Conduct analyses of ecosystems and document the interactions of living species and non-living resources.	Team activity Written exam	AFNR Career Cluster, Statement 1 AFNR Career Cluster, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9
NRS.01.01.03.b. Analyze how biodiversity develops through evolution, natural selection and adaptation; assess the importance of biodiversity to ecosystem function and availability of natural resources.	Written exam	AFNR Career Cluster, Statement 1 AFNR Career Cluster, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9
NRS.01.01.03.c. Evaluate biodiversity in ecosystems and devise strategies to enhance the function of an ecosystem and the availability of natural resources by increasing the level of biodiversity.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 STEM Career Cluster, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9
NRS.01.02. Performance Indicator: Classify different types of natural resources in order to enable protection, conservation, enhancement and management in a particular geographical region.		
NRS.01.02.01.b. Apply identification techniques to determine the species of a tree or woody plant.	Identification	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7

		CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 HS-ESS3-2
NRS.01.02.02.b. Apply identification techniques to determine the species of an herbaceous plant.	Identification	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 HS-ESS3-2
NRS.01.02.03.b. Apply identification techniques to determine the species of wildlife or insect.	Identification	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 HS-ESS3-2
NRS.01.02.04.b. Apply identification techniques to determine the species of an aquatic organism.	Identification	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2

		HS-ESS3-2
NRS.01.02.05.b. Apply identification techniques to determine the types of non-living resources in an area.	Identification	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 HS-ESS3-2
NRS.01.03. Performance Indicator: Apply ecological concepts and principles to atmospheric natural resource systems.		
NRS.01.03.02.b. Analyze the impact that climate has on natural resources and how this impact has changed due to human activity.	Team activity	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS2-4 HS-ESS2-6 HS-ESS3-4 HS-ESS3-5
NRS.01.03.02.c. Identify the primary causes of climate change and design strategies to lessen its impact on natural resource systems.	Written exam	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS2-4 HS-ESS2-6 HS-ESS3-4 HS-ESS3-5

NRS.01.04. Performance Indicator: Apply ecological concepts and principles to aquatic natural resource systems.		
NRS.01.04.01.b. Assess the function of watersheds and their effect on natural resources.	Soils analysis Team activity	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS2-4 HS-ESS2-6 HS-ESS3-4 HS-ESS3-5
NRS.01.04.01.c. Evaluate and defend the importance of watersheds to ecosystem function.	Soils analysis Team activity	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS2-4 HS-ESS2-6 HS-ESS3-4 HS-ESS3-5
NRS.01.04.02.c. Devise strategies to manage, protect, enhance or improve sources of groundwater or surface water based on its properties.	Team activity	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS2-4 HS-ESS2-6 HS-ESS3-4 HS-ESS3-5

NRS.01.04.03.b. Assess techniques used in the creation, enhancement and management of riparian zones and riparian buffers.	Soils analysis Team activity	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS2-4 HS-ESS2-6 HS-ESS3-4 HS-ESS3-5
NRS.01.04.03.c. Devise strategies for the creation, enhancement and management of riparian zones and riparian buffers.	Team activity	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS2-4 HS-ESS2-6 HS-ESS3-4 HS-ESS3-5
NRS.01.05. Performance Indicator: Apply ecological concepts and principles to terrestrial natural resource systems.		
NRS.01.05.01.b. Analyze and summarize examples of stages of succession.	Team activity Written exam	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS3-4 HS-ESS3-2
NRS.01.05.01.c. Evaluate the stages of succession present in an ecosystem and predict which species will become more prevalent through future stages of succession.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1

		CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS3-4 HS-ESS3-2
NRS.01.05.02.b. Analyze and summarize examples of habitat disturbances and habitat resilience.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS3-4 HS-ESS3-2
NRS.01.05.02.c. Interpret signs of habitat disturbances and resilience in an ecosystem and use these signs to assess the health of an ecosystem.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS3-4 HS-ESS3-2
NRS.01.05.03.c. Devise a forest management plan that improves the habitat while sustainably maximizing the amount of timber that can be harvested.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS3-4 HS-ESS3-2
NRS.01.05.04.b. Analyze a plot of land in order to determine which soil management techniques would be most applicable.	Team activity Soils analysis	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3

		CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS3-4 HS-ESS3-2
NRS.01.05.04.c. Devise a soil management plan to minimize erosion and maximize biodiversity, plant productivity, and the formation of topsoil.	Soils analysis Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-ESS3-4 HS-ESS3-2
NRS.01.06. Performance Indicator: Apply ecological concepts and principles to living organisms in natural resource systems.		
NRS.01.06.01.c. Create a management plan for a population of a species in an ecosystem given its population ecology, population density and population dispersion.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 HS-LS4-4 HS-LS4-6 HS-ESS3-4
NRS.01.06.02.b. Analyze factors that influence the establishment and spread of invasive species and determine the appropriate steps to prevent or minimize the impact of invasive species.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5

		CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 HS-LS4-4 HS-LS4-6 HS-ESS3-4
NRS.01.06.02.c. Evaluate the presence and impact of invasive species on natural resources in a given area and devise a plan to prevent, control or eliminate invasive species from that habitat.	Team activity	AFNR Career Cluster, Statement 1 AFNR Career Cluster – Animal Systems Pathway, Statement 3 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.9-10.9 CCSS.ELA-LITERACY.WHST.11-12.9 HS-LS4-4 HS-LS4-6 HS-ESS3-4
NRS.02.01. Performance Indicator: Examine and interpret the purpose, impact and effectiveness of laws and agencies related to natural resource management, protection, enhancement and improvement.		
NRS.02.01.02.b. Analyze the specific purpose of agencies associated with natural resources systems.	Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster – Agribusiness Systems Pathway, Statement 1 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 STEM Career Cluster, Statement 3
NRS.02.01.02.c. Evaluate the impact and effectiveness of agencies associated with natural resources systems (e.g., regulation of consumption, prevention of damage to natural resources systems, management of ecological interactions, etc.).	Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster – Agribusiness Systems Pathway, Statement 1 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 STEM Career Cluster, Statement 3
NRS.02.02. Performance Indicator: Assess the impact of human activities on the availability of natural resources.		
NRS.02.02.01.b. Assess how different kinds of human activity affect the use and availability of natural resources (i.e., agriculture, industry, transportation, etc.).	Team activity	AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 2 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8

		CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-7 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4 HS-ESS3-5 HS-ESS3-6
NRS.02.02.01.c. Evaluate how the availability of natural resources can be improved through changes to human activity.	Team activity	AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 2 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-7 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4 HS-ESS3-5 HS-ESS3-6
NRS.02.02.02.b. Assess causes of extinction and how those causes related to loss of biodiversity.	Team activity	AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 2 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-7 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4 HS-ESS3-5

		HS-ESS3-6
NRS.02.02.02.c. Devise a strategy for preventing the loss of species and biodiversity that takes into account the primary causes of species extinction from human activity.	Team activity	AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 2 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-7 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4 HS-ESS3-5 HS-ESS3-6
NRS.02.02.03.b. Identify solutions to improve the sustainability of modern lifestyles.	Team activity	AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 2 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-7 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4 HS-ESS3-5 HS-ESS3-6
NRS.02.02.03.c. Evaluate how modern lifestyles affect resource consumption and energy use and devise a strategy to prevent the complete loss of a natural resource.	Team activity	AFNR Career Cluster – Animal Systems Pathway, Statement 1 STEM Career Cluster, Statement 2 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.2 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.2 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.9-10.7

		CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 HS-LS2-7 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4 HS-ESS3-5 HS-ESS3-6
NRS.02.03. Performance Indicator: Analyze how modern perceptions of natural resource management, protection, enhancement and improvement change and develop over time.		
NRS.02.03.01.b. Analyze how social considerations can affect the use and sustainability of natural resources.	Team activity	AFNR Career Cluster, Statement 7
NRS.02.03.02.b. Examine the relationship between current trends in natural resource systems and historical figures that played a prominent role in shaping how natural resources are viewed and used today.	Written exam	AFNR Career Cluster, Statement 7
NRS.02.03.03.b. Analyze and document how some technological advancements changed how natural resources were used and viewed (e.g., Industrial Revolution, fossil fuels, green technology, etc.).	Team activity Waste management	AFNR Career Cluster, Statement 7
NRS.02.04. Performance Indicator: Examine and explain how economics affects the use of natural resources.		
NRS.02.04.01.c. Devise a plan to improve the conservation, protection, improvement and enhancement of natural resources based on economic value and practices.	Team activity	AFNR Career Cluster, Statement 4 AFNR Career Cluster – Agribusiness Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 4 AFNR Career Cluster – Plant Systems Pathway, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.11-12.8 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.ELA-LITERACY.SL.11-12.4

NRS.02.04.02.c. Anticipate and predict how changes to the availability of natural resources because of human activity may impact a local, state and national economy.	Team activity	AFNR Career Cluster, Statement 4 AFNR Career Cluster – Agribusiness Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 4 AFNR Career Cluster – Plant Systems Pathway, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.11-12.8 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.ELA-LITERACY.SL.11-12.4
NRS.02.04.03.c. Anticipate and predict the economic impact of green technology and alternative energy.	Team activity	AFNR Career Cluster, Statement 4 AFNR Career Cluster – Agribusiness Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 4 AFNR Career Cluster – Plant Systems Pathway, Statement 1 CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.WHST.11-12.2 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.ELA-LITERACY.WHST.11-12.8 CCSS.ELA-LITERACY.WHST.11-12.9 CCSS.ELA-LITERACY.SL.11-12.4
NRS.02.05. Performance Indicator: Communicate information to the public regarding topics related to the management, protection, enhancement, and improvement of natural resources.		
NRS.02.05.01.c. Devise a strategy for communicating a natural resources message through media.	Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Statement 3 STEM Career Cluster, Statement 2 STEM Career Cluster, Statement 3
NRS.02.05.02.c. Anticipate and predict how messages about the conservation, management, enhancement and improvement of natural resources will change because of social media and the Internet.	Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Statement 3 STEM Career Cluster, Statement 2 STEM Career Cluster, Statement 3
NRS.02.05.03.c. Create a communication plan to influence the behavior of people, call people to action and instill a sense of civic behavior related to the conservation, management, enhancement and improvement of natural resources.	Team activity	AFNR Career Cluster, Statement 2 AFNR Career Cluster, Statement 3 STEM Career Cluster, Statement 2 STEM Career Cluster, Statement 3

NRS.03.01. Performance Indicator: Sustainably produce, harvest, process and use natural resource products (e.g., forest products, wildlife, minerals, fossil fuels, shale oil, alternative energy, recreation, aquatic species, etc.).		
NRS.03.01.04.b. Assess the economic impact of fossil fuel extraction in regards to the costs and benefits to a local, state and/or national economy.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.04.c. Evaluate methods used to extract and process fossil fuels for economic, environmental and social sustainability.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.05.b. Assess the economic impact of shale oil extraction (i.e., fracking) in regards to the costs and benefits to a local, state and/or national economy.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.05.c. Evaluate methods used to extract and process shale oil for economic, environmental and social sustainability.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.06.b. Assess and evaluate factors that affect the economic, environmental and social sustainability in regards to the use of alternative sources of energy.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.06.c. Assess trends in energy production and consumption in order to predict how the impact of alternative energy will change in the future.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3

NRS.03.01.07.b. Assess different options for improving the sustainability of outdoor recreation based on its impact on natural resources and likelihood of acceptance.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.07.c. Evaluate an example of outdoor recreation and develop suggestions for how that activity can be made more sustainable in a manner that is acceptable to those who take part in that activity.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.08.b. Analyze and document techniques used to acquire aquatic species for their environmental, economic and social sustainability.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.01.08.c. Develop recommendations for the sustainable harvest of aquatic species.	Team activity	AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 AFNR Career Cluster – Plant Systems Pathway, Statement 4 CCSS.ELA-LITERACY.RST.11-12.8 HS-ESS3-2 HS-ESS3-3
NRS.03.02. Performance Indicator: Demonstrate cartographic skills, tools and technologies to aid in developing, implementing and evaluating natural resource management plans.		
NRS.03.02.01.b. Apply cartographic skills and tools (e.g., land surveys, geographic coordinate systems, etc.) to locate natural resources.	GPS	
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.).	Data analysis Team activity Waste management	
NRS.03.02.02.b. Analyze how an area's natural resources could be assessed using GIS technology.	Data analysis GPS	

NRS.03.02.02.c. Use GIS data for a given area to devise a management plan for the management, conservation, improvement, and enhancement of its natural resources.	Team activity Waste management	
NRS.04.01. Performance Indicator: Demonstrate natural resource protection, maintenance, enhancement and improvement techniques.		
NRS.04.01.01.b. Assess indicators of the biological health of a stream.	Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.01.c. Create an enhancement plan for a stream.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.02.b. Assess the methods used to improve a forest stand.	Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3

		CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.02.c. Create a timber stand improvement plan for a forest.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.03.b. Assess methods of wildlife habitat improvement.	Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.03.c. Devise a comprehensive improvement plan for a wildlife habitat.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2

		HS-ESS3-3 HS-ESS3-4
NRS.04.01.04.b. Assess methods of rangeland improvement.	Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.04.c. Evaluate and revise a rangeland management plan.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.05.b. Assess management techniques for improving outdoor recreation opportunities.	Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4

NRS.04.01.05.c. Evaluate the impact of recreational activities on natural resources and create an improvement plan.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.06.b. Assess methods to improve marine and coastal natural resources.	Written exam	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.01.06.c. Create an improvement plan for marine or coastal natural resources.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4

NRS.04.02. Performance Indicator: Diagnose plant and wildlife diseases and follow protocols to prevent their spread		
NRS.04.02.01.c. Create a management plan to reduce infection and the spread of plant diseases in natural resource systems.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.02.02.c. Create a management plan to reduce infection and spread of wildlife or aquatic species diseases in natural resource systems.	Team activity	AFNR Career Cluster – Environmental Service Systems Pathway, Statement 3 AFNR Career Cluster – Environmental Service Systems Pathway, Statement 4 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 2 AFNR Career Cluster – Natural Resources Systems Pathway, Statement 5 AFNR Career Cluster – Plant Systems Pathway, Statement 2 AFNR Career Cluster – Plant Systems Pathway, Statement 3 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.SL.11-12.4 HS-ESS3-2 HS-ESS3-3 HS-ESS3-4
NRS.04.03. Performance Indicator: Prevent or manage introduction of ecologically harmful species in a particular region.		
NRS.04.03.01.c. Create a management plan to reduce spread of harmful insects in natural resource systems.	Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-LS2-7 HS-LS4-6

NRS.04.03.02.c. Create a management plan to reduce spread of harmful invasive species in natural resource systems.	Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-LS2-7 HS-LS4-6
NRS.04.03.03.c. Identify potentially invasive species and devise strategies to prevent ecological damage that would result from the introduction of that species.	Team activity	CCSS.ELA-LITERACY.RST.11-12.1 CCSS.ELA-LITERACY.RST.11-12.7 CCSS.ELA-LITERACY.RST.11-12.8 CCSS.ELA-LITERACY.WHST.9-10.5 CCSS.ELA-LITERACY.WHST.11-12.5 CCSS.ELA-LITERACY.WHST.9-10.7 CCSS.ELA-LITERACY.WHST.11-12.7 CCSS.MATH.CONTENT.HSN-Q.A.1 CCSS.MATH.CONTENT.HSN-Q.A.2 CCSS.MATH.CONTENT.HSN-Q.A.3 CCSS.MATH.CONTENT.HSS-ID.A.1 CCSS.MATH.CONTENT.HSS-IC.A.1 CCSS.MATH.CONTENT.HSS-IC.B.6 HS-LS2-7 HS-LS4-6
NRS.04.04. Performance Indicator: Manage fires in natural resource systems.		
NRS.04.04.01.a. Differentiate between desirable and undesirable fires and research the role fire plays in a healthy ecosystem.	Written exam	
NRS.04.04.01.c. Develop a prevention plan for harmful fires for a particular region.	Team ativity	
NRS.04.04.02.c. Anticipate and predict how fire management techniques will evolve in the future.	Team activity	
PS.01.02. Performance Indicator: Prepare and manage growing media for use in plant systems.		
PS.01.02.02.b. Discuss how soil drainage and water-holding capacity can be improved.	Soils management practicum Written exam	

PS.01.02.02.c. Determine the hydraulic conductivity for soil and how the results influence irrigation practices.	Soils management practicum	
PS.01.03. Performance Indicator: Develop and implement a fertilization plan for specific plants or crops.		
PS.01.03.01.b. Analyze the effects of nutrient deficiencies and symptoms and recognize environmental causes of nutrient deficiencies.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.01.03.02.c. Adjust the pH of growing media for specific plants or crops.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.01.03.03.b. Interpret laboratory analyses of soil and tissue samples.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.01.03.03.c. Prescribe fertilizer applications based on the results of a laboratory analysis of soil and plant tissue samples.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.01.03.04.b. Calculate the amount of fertilizer to be applied based on nutrient recommendation and fertilizer analysis.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.01.03.05.c. Devise a plan for soil management for a selected production method.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.01.03.06.b. Assess environmental factors on a crop.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.01.03.06.c. Devise a plan to meet plant nutrient needs based on environmental factors present.	Soils management practicum	CCSS.MATH.CONTENT.HSN.Q.A.2 CCSS.MATH.CONTENT.HSN.Q.A.3
PS.02.01. Performance Indicator: Classify plants according to taxonomic systems.		
PS.02.01.02.a. Describe the morphological characteristics used to identify agricultural and herbaceous plants (e.g., life cycles, growth habit, plant use and as monocotyledons or dicotyledons, woody, herbaceous, etc.).	Identification Written exam	

PS.02.01.02.b. Identify and describe important plants to agricultural and ornamental plant systems by common names.	Identification	
PS.03.01. Performance Indicator: Demonstrate plant propagation techniques in plant system activities.		
PS.03.01.05.c. Evaluate the impact of using genetically modified crops on other production practices.	Team activity	
PS.03.03. Performance Indicator: Develop and implement a plan for integrated pest management for plant production.		
PS.03.03.01.c. Devise solutions for plant pests, diseases and disorders.	Team activity	
PS.03.05. Performance Indicator: Harvest, handle and store crops according to current industry standards.		
PS.03.05.01.b. Assess the stage of growth to determine crop maturity or marketability and demonstrate proper harvesting techniques.	Team activity	CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.WHST.9-10.2a

PS.03.05.01.c. Analyze the process used by mechanical harvesting equipment.	Team activity	CCSS.ELA-Literacy.RST.9-10.3 CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.WHST.9-10.2a
PS.04.02. Performance Indicator: Create designs using plants.		
PS.04.02.03.c. Utilize green technologies and sustainable practices that prevent or limit negative environmental impacts.	Team activity	AFNR Career Cluster – Natural Resources Systems Pathway, Statement 3 AFNR Career Cluster – Plant Systems Pathway, Statement 2 STEM Career Cluster, Statement 4
PST.01.01. Performance Indicator: Apply physical science and engineering principles to assess and select energy sources for AFNR power, structural and technical systems.		
PST.01.01.01.b. Assess the environmental impacts of renewable and nonrenewable energy sources used in AFNR.	Team activity	AFNR Career Cluster, Statement 4 AFNR Career Cluster, Statement 5 HS-ESS3-3 HS-PS3-3
PST.01.01.01.c. Design and implement methods to evaluate the efficiency of renewable and nonrenewable energy sources used in AFNR.	Team activity	AFNR Career Cluster, Statement 4 AFNR Career Cluster, Statement 5 HS-ESS3-3 HS-PS3-3
PST.01.01.02.c. Devise a strategy to incorporate the use of selected energy sources in an ANFR enterprise or business.	Team activity	AFNR Career Cluster, Statement 4 AFNR Career Cluster, Statement 5 HS-ESS3-3 HS-PS3-3
PST.05.03. Performance Indicator: Apply geospatial technologies to solve problems and increase the efficiency of AFNR systems.		
PST.05.03.01.b. Assess and analyze data collected utilizing geospatial technologies.	GPS	HS-ESS3-4 HS-ETS1-3 HS-ESS3-2
PST.05.03.01.c. Collect data and create maps utilizing geospatial technologies.	GPS	HS-ESS3-4 HS-ETS1-3 HS-ESS3-2