NEW JERSEY FFA

CAREER AND LEADERSHIP DEVELOPMENT EVENTS

Veterinary Science
2023

Purpose

The purpose of the New Jersey FFA Veterinary Science Career Development Event is to promote college and career readiness by providing opportunities to develop technical knowledge and demonstrate practical skills in the field of veterinary science.

Objectives

Participants will demonstrate professional ethics, decision-making, business competency, communication and problem-solving skills.

Participants will demonstrate technical competency with small and large animals in the areas of:
- Anatomy and physiology
- Clinical procedures
- Identification
- Health and safety
- Medical terminology
- Veterinary math applications

Event Rules

Teams will consist of four members with all four members' scores counting toward total team score.

DRESS CODE
- All participants must wear either scrubs (top and bottoms; solid color) or polo with slacks. All participants must wear closed toe, closed heel and flat shoes (no clogs, sandals or flip-flops). No jewelry may be worn. This includes rings, bracelets, earrings and exposed body piercings.

TOOLS AND EQUIPMENT
Materials to be provided by the student:
- Two no. 2 pencils
- Calculator (cell phone and programmable calculators will not be permitted)
- Clipboard

FFA will provide the specific tools and equipment needed to complete practicums.

Any participant in possession of an electronic device in the event area is subject to disqualification.

FLOW OF EVENT
- **Written Exam** – 30 minutes
- **Math Applications Exam** – 30 minutes
- **Current Events** – 30 minutes
- **Identification** – 30 minutes
- **Practicums** – 30 minutes (total for 2-4 activities)

INDIVIDUAL ACTIVITIES
denotes a hands-on practicum area

MATH APPLICATIONS EXAM (100 POINTS)

The number of practicum questions will vary based on the type of activity that is assigned. Participants will have 30 minutes to complete the entire math application practicum. Questions may include conversions, dose calculations, dilutions, cost calculations and invoices.

WRITTEN EXAM (100 POINTS)

The objective exam is designed to determine team members' broad understanding of the veterinary science field. The written exam will consist of 50 questions. Thirty minutes will be given for the exam.

Topics for the exam may include:
- Behavior
- Disease (causes and sources, signs and clinical signs)
- Medical terminology
- Medical records
- Anatomy/physiology
- Regulations (OSHA: Federal Occupational Safety and Health Administration; GHS: Globally Harmonized System for Hazard Communication; SDS: Safety Data Sheets)
- Patient management
- Facility management
- Practice management
- Genetics
- Nutrition
- Husbandry

CURRENT EVENTS (100 POINTS)

The current event activity will allow students to utilize critical thinking and problem-solving skills. Thirty minutes total will be allowed to complete this portion of the event. Participants will be provided a current event topic at least 1 month prior to the event. The current event portion could be a blend of writing and digital evaluation. Written responses may range from short answers to essays.

IDENTIFICATION (100 POINTS TOTAL)

Participants will identify equipment (25 items), parasites/microscopic (15 items) and breeds/species (10 items) for a total of 100 points (two points per item). Thirty minutes will be given for this activity. Identification lists are located at the end of this handbook. Items may be displayed as photos, actual equipment and/or displayed through a microscope.

PRACTICUMS (UP TO 200 POINTS) TOTAL*
- Clinical Procedure Practicum* (200 points)
  - Participants will be given two to four clinical procedure activities to complete (50 points each). Fifteen to thirty minutes will be allotted for this section depending on the activities selected each year. Participants are expected to talk through the clinical procedure steps to a judge as they are being scored. Judges may ask participants for clarification on steps performed. All clinical procedure scorecards can be found at the end of this handbook.

- Handling and Restraining Practicum* (120 points)

o   Participants will be given two to four handling/restraint activities to complete (30 points each). Fifteen to thirty minutes will be allotted for this section depending on the activities selected each year. Participants are expected to talk through the handling and restraining steps to a judge as they are being scored. Judges may ask participants for clarification on steps performed. All handling and restraining scorecards can be found at the end of this handbook.

*2-4 activities will make up the practicum round. Clinical Procedure activities will be conducted in odd years and Handling & Restraining activities will be conducted in even years.

TEAM ACTIVITIES
CURRENT EVENTS (200 POINTS)
The current event activity will allow students to utilize critical thinking, problem-solving, and teamwork skills. Thirty minutes total will be allowed to complete this portion of the event.

Teams will be provided a current event topic at least 1 month prior to the event. The current event portion could be a blend of writing and digital evaluation. Written responses may range from short answers to essays.

The team will be provided a specific scenario when they begin their team activity.
Teams will have 30 minutes to evaluate the information provided and prepare questions, diagnostics and recommendations as well as explain steps and procedures for the veterinary process in their plan.
Teams need to determine what aspects of veterinary medicine and roles are most important to include based on the annual topic.

Resources provided for the team activity may include diagnostic information like blood work, synopsis of disease state, treatment recommendations and cost information.

TIEBREAKERS
If ties occur, the following events will be used in order to determine award recipients:

INDIVIDUAL
- Written Exam
- Identification
- Combined Practicum

TEAM
- Written Exam
- Identification
- Combined Practicum

Scoring

Total Possible Individual Points: up to 500 points
Total Points per Team: up to 2,500 points
Total Points Possible are based on the number and type of practicums selected.

- **Written Exam** – 100 points
- **Current Event** – 200 points
- **Identification** – 100 points
- **Math Applications** – 100 points
- **Practicum Total** – up to 200 points

Awards

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

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

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

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

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. Make sure to use discretion when selecting website references by only using reputable, proven sites. The following list contains references that may prove helpful during event preparation. The most current edition of resources will be used.

Past CDE materials and other resources are available by logging in to FFA.org.
• Small Animal Care and Management. Warren. ISBN: 978-1-4180-4105-2
• McCurnin's Clinical Textbook for Vet Technicians, 8th edition. ISBN 978-1-4377-2690-0
• Veterinary Instruments and Equipment: A Pocket Guide. Sonsthagen. ISBN: 978-0323032032
• American Kennel Club, http://www.akc.org/index.cfm
• Cat Fanciers' Association, https://cfa.org/breeds/
• American Rabbit Breeders Association, http://www.arba.net/
• Cattle Breeds, http://afs.okstate.edu/breeds/
• Medical Mathematics and Dosage Calculations for Veterinary Professionals. Bill, Robert. ISBN: 978-08138263
• National Vet Science Math Practicum Units of Measurement, common formulas and conversions for students to use as they may appear on the Math Practicum, FFA.org

SUPPLEMENTAL RESOURCES
• https://todaysveterinarypractice.com/
• atdove.com

BODY CONDITION SCORES
• Cat & Dog: https://www.purinainstitute.com/centresquare/nutritional-and-clinical-assessment/purina-body-condition-system
• Horse: https://ker.com/wp-content/uploads/body-condition-score-chart.pdf

Equipment and Materials Identification List

100. Anesthetic machines
101. Autoclave
102. Autoclave tape indicator
103. Backhaus towel clamps
104. Balling gun
105. Bandaging material — Elasticon
106. Bandaging material — roll gauze
107. Bandaging material — vet wrap
108. Bands (castration or docking)
109. Catheter — IV
110. Catheter — Tomcat urinary
111. Cautery
112. Centrifuge
113. Chemical indicator strips
114. Dehorner — Barnes
115. Dehorner — electric
116. Dental/Power Float
117. Dental scaler
118. Large Animal Ear Tagger
119. Ear notcher
120. Elastrator
121. Electronic ID Reader
122. Elizabethan collar
123. Emasculators
124. Endotracheal tubes
125. Fecal loop

126. Fecalyzer
127. Fetal extractor — calf
128. Forceps — Allis tissue
129. Forceps — Babcock tissue
130. Forceps — Brown-Adson thumb
131. Forceps — Crile
132. Forceps — Kelly
133. Forceps — Rat tooth thumb
134. Forceps —Rochester Carmalt
135. Hog snare
136. Hoof knife
137. Hoof rasp
138. IV Fluid Bag
139. Muzzle — basket
140. Muzzle — nylon
141. Needle holder — Olsen-Hegar
142. Obstetrical chain and handle
143. Ophthalmoscope
144. Otoscope
145. Pig tooth nippers

146. Rumen magnet
147. Scalpel blade
148. Scalpel handle
149. Scissors — Utility Bandage
150. Scissors — Lister bandage
151. Scissors — Mayo dissecting
152. Scissors — Metzenbaum dissecting
153. Silver nitrate sticks
154. Snook ovariohysterectomy hook
155. Speculum — Equine
156. Speculum — Frick/Bovine
157. Cattle Handling Restraint Device
158. Staple remover
159. Stethoscope
160. Syringe — Leur Lock
161. Syringe — Slip Tip
162. Syringe — automatic, multi-dose
163. Tattooing instruments
164. Thermometer
165. Trocar and cannula
166. Humane Twitch

Parasite/Microscopic Identification List

200. Cat Warble (Genus Cuterebra)
201. Coccidia (Genus Isospora or Eimeria)
202. Demodectic Mite (Genus Demodex)
203. Ear Mite (Family Psoroptidae; Genus Otodectes)
204. Flea Tapeworm Egg (Genus Dipylidium)
205. Flea Tapeworm Segment (Genus Dipylidium)
206. Giardia (Genus Giardia)
207. Heartworm Adult (Genus Dirofilaria)
208. Heartworm Microfilaria (Genus Dirofilaria)
209. Hookworm Adult (Family Ancylostomatidae; Genus Ancylostoma, Uncinaria, Bunostomum or Globocephalus)
210. Hookworm Egg (Family Ancylostomatidae; Genus Ancylostoma, Uncinaria, Bunostomum or Globocephalus)
211. Horse Strongyles (Family Strongylidae; Genus Strongylus)
212. Liver Fluke (Class Trematoda; Genus Fasciola, Fascioloides or Dicrocoelium)
213. Mosquito Larva (Family Culicidae; Genus Anopheles, Culex or Aedes)
214. Neutrophils
215. Platelets
216. Mammalian red blood cell (erythrocyte)
217. Avian red blood cell (erythrocyte)
218. Roundworm Adult (Family Ascarididae or Toxocaridae; Genus Toxocara, Toxascaris, Ascaris, Parascaris or Neoascaris)
219. Roundworm Egg (Family Ascarididae or Toxocaridae; Genus Toxocara, Toxascaris, Ascaris, Parascaris or Neoascaris)
220. Sarcoptic Mite (Family Sarcoptidae; Genus Sarcoptes or Notoedres)
221. Taenia Tapeworm Egg (Family Taeniidae; Genus Taenia)
222. Taenia Tapeworm Segment (Family Taeniidae; Genus Taenia)
223. Tick — American Dog (Family Dermacentor; Genus variabilis)
224. Tick — Black Legged Deer (Family Ixodes; Genus scapularis)
225. Tick — Brown Dog (Family Rhipicephalus; Genus sanguineus)
226. Tick — Lonestar (Family Amblyomma; Genus americanum)
227. Whipworm Egg (Genus Trichuris)
228. Whipworm (Genus Trichuris)

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Breed/Species Identification List

DOGS

HERDING GROUP
300. Australian Cattle Dog
301. Australian Shepherd
302. Border Collie
303. Collie
304. German Shepherd Dog
305. Old English Sheepdog
306. Pembroke Welsh Corgi

HOUND GROUP
307. Basset Hound
308. Beagle
309. Bloodhound
310. Dachshund
311. Greyhound
312. Rhodesian Ridgeback

NON-SPORTING GROUP
313. Bichon Frise
314. Boston Terrier
315. Bulldog
316. Chow Chow
317. Dalmatian
318. Poodle

SPORTING GROUP
319. Brittany Spaniel
320. Cocker Spaniel
321. English Setter
322. German Shorthaired Pointer
323. Golden Retriever
324. Irish Setter
325. Labrador Retriever
326. Weimaraner

TERRIER GROUP
327. Bull Terrier
328. Cairn Terrier
329. Parson Russell Terrier
330. Scottish Terrier
331. West Highland White Terrier

TOY GROUP
332. Cavalier King Charles Spaniel
333. Chihuahua
334. Miniature Pinscher
335. Papillon
336. Pekingese
337. Pomeranian
338. Toy Poodle
339. Pug
340. Shih Tzu
341. Yorkshire Terrier

WORKING GROUP
342. Bernese Mountain Dog
343. Boxer
344. Doberman Pinscher
345. Great Dane
346. Great Pyrenees
347. Mastiff
348. Newfoundland
349. Rottweiler
350. Saint Bernard
351. Siberian Husky

CATS
352. Abyssinian
353. American Shorthair
354. Burmese
355. Maine Coon
356. Manx
357. Persian
358. Ragdoll
359. Russian Blue
360. Siamese
361. Sphynx

BIRDS
362. African Gray Parrot
363. Canary
364. Cockatiel
365. Cockatoos
366. Love Birds
367. Macaw
368. Parakeet
369. Sun Conure
370. Zebra Finch

Breed/Species Identification List continued

REPTILES
371. Bearded Dragon
372. Chameleon
373. Gecko
374. Iguana
375. Ball Python
376. Burmese Python
377. Corn Snake

POULTRY
378. Chicken — Cornish
379. Chicken — Leghorns
380. Chicken — Plymouth Rock
381. Chicken — Rhode Island Red
382. Duck
383. Turkey

SMALL MAMMALS
384. Ferret
385. Guinea Pig
386. Hamster
387. Hedgehog
388. Mouse
389. Rat

RABBITS
390. Angora
391. Californian
392. Dutch
393. English Spot
394. Holland Lop
395. Mini-Rex
396. Netherland Dwarf
397. New Zealand

DAIRY CATTLE
398. Ayrshire
399. Brown Swiss
400. Guernsey
401. Holstein
402. Jersey

BEEF CATTLE
403. Angus
404. Brahman
405. Charolais
406. Hereford
407. Shorthorn

HORSE
408. Appaloosa
409. Arabian
410. Belgian
411. Clydesdale
412. Morgan
413. Paint
414. Percheron
415. Quarter Horse
416. Saddlebred
417. Tennessee Walking Horse
418. Thoroughbred

GOAT
419. Nubian
420. Angora
421. Boer
422. LaMancha

SHEEP
423. Columbia
424. Dorper
425. Dorset
426. Hampshire
427. Merino
428. Rambouillet
429. Southdown
430. Suffolk

SWINE
431. American Landrace
432. Berkshire
433. Chester White
434. Duroc
435. Hampshire
436. Yorkshire

New Jersey FFA Career and Leadership Development Event Handbook

Current Events Rubric
200 points

NAME _____   CHAPTER _____

INDICATORS	Very strong evidence of skill is present 5-4 points	Moderate evidence of skill is present 3-2 points	Strong evidence of skill is not present 1-0 points	Points Earned	Weight	Total Points
WRITTEN COMMUNICATION						
Spelling/grammar (sentence structure, verb agreement, etc.)	Spelling and grammar are extremely high quality. • Two or fewer spelling errors are present. • Two or fewer grammar errors are present.	Spelling and grammar are adequate. • Three to five spelling errors are present. • Three to five grammar errors are present.	Spelling and grammar are less than adequate. • Six or more spelling errors are present. • Six or more grammar errors are present.		X1	
Message	Communicates ideas extremely clearly as well as extremely focused. Thoughts are very interesting and understandable. • All main ideas are supported by clear and vivid details. • Clearly organized and concise by remaining on target, is completely focused with obvious construction and strong introduction, body and conclusion layout.	Communicates ideas clearly and concisely, and message is interesting and understandable. • Most of the main ideas are supported by sufficient details. • Good organization with few statements out of place or lacking in clear construction.	Communicates ideas clearly, but message is difficult to understand. • None of the main ideas are supported by sufficient details. • Little to no organization is present and is sometimes awkward and lacking construction.		X3	
Writing Style	Writing style is selectively appropriate for the intended audience. • The style chosen has obviously been well thought-out based on the specific audience.	Thought was given to the intended audience, and the style reflects the purpose for communicating with that audience. • Most language is appropriate for the intended audience.	Writing style does not show intent to connect with different types of audiences, style is more for a generic reader. • Some language used might be confusing for some audiences		X1	

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INDICATORS	Very strong evidence of skill is present 5-4 points	Moderate evidence of skill is present 3-2 points	Strong evidence of skill is not present 1-0 points	Points Earned	Weight	Total Points
CONTENT						
Critical Thinking/ Problem- Solving Skills	Uses general methods, in an orderly manner, for finding solutions to specific problems. • Evaluates evidence and assesses conclusions. • Develops and defends a reasonable position or argument.	Uses limited critical thinking skills in determining solutions to problems. • Develops moderate defense to conclusion for position or argument.	Uses weak critical thinking skills in determining solutions to problems. • Develops weak defense to conclusion for position or argument.		X3	
Inductive Reasoning Skills	Establishes a logical, systematic process of achieving certain ends with accuracy and efficiency. • Gathers together particular observations in the form of premises. • Moves from specific premises to a general conclusion.	Establishes a shallow reasoning process of achieving certain ends. • Gathers together limited observations in the form of premises. • Moves from incomplete specific premises to a general conclusion.	Establishes an inadequate reasoning process of achieving certain ends. • Incompletely gathers observations in the form of specific premises. • Inadequately formulates a general conclusion.		X3	
Veterinary topic research	Demonstrates prior research and preparedness of the veterinary topic	Demonstrates some prior research and preparedness of the veterinary topic.	Does not demonstrate prior research and preparedness of the veterinary process.		X2	
	Full understanding of disease and/or veterinary process	Some understanding of disease and/or veterinary process	Does not understand the disease and/or veterinary process		X2	
	Full understanding of treatment protocols and/or recommendation for the topic	Some understanding of treatment protocols and/or recommendation for the topic	Does not understand the treatment protocols and/or recommendation for the topic		X2	
Demonstrates knowledge of topic	Presentation supports strong knowledge of the subject with good evidence of support.	Presentation supports some knowledge of the subject with fair evidence of support.	Presentation supports little knowledge of the subject with poor evidence of support.		X3	
			TOTAL POINTS			

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Clinical Procedures Practicum

Administering Aural Medication

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student successfully administered the proper amount of medication into the ear canal. • Ear pinna held upright • Correct amount of medication was administered without contamination	20	
The student massages the base of the outside of the ear canal causing a swishing sound from the medication moving around in the ear canal.	15	
The student wipes any solution that may have leaked onto the outside of the ear flap or hair.	15	
TOTAL POINTS	50	

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Clinical Procedures Practicum

Administering Ophthalmic Medication

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student wipes any discharge from the patient's eye using a gauze sponge or cotton ball.	8	
The student opens the end of the ophthalmic medicine	6	
The student uses the index finger and thumb to pull the upper and lower lids apart to open the eye. The student's thumb pulls the lower lid down and the index finger pulls the upper lid upward. The student's other finger may rest on the head of the animal.	12	
While resting the hand holding the medication on the head of the patient, the student applies the drops or ointment gently into the eye without touching the eye, counting each drop or applying the proper amount of ointment without contamination.	12	
The student releases the eyelids.	6	
The student allows the animal to blink to move the medication throughout the eye.	6	
TOTAL POINTS	50	

Clinical Procedures Practicum

Administering an Intramuscular Injection

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student selected the proper site for administration.	10	
The student directs the needle through the skin and into the muscle.	10	
The student aspirates; if no blood is noted, inject.	10	
The student withdraws the needle and places in the sharps container.	10	
The student massages the area where the injection was given and praises the patient.	10	
TOTAL POINTS	50	

Clinical Procedures Practicum

Administering a Subcutaneous Injection

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student lifts the skin using the thumb and forefinger forming a triangle or tent with the skin.	10	
The student inserts the needle into the skin at the base of the tent or triangle parallel to the body.	10	
The student aspirates; looking for any signs of blood entering the syringe; if no blood enters the syringe, the student administers the injection.	10	
The student withdraws the needle and places in the sharps container.	10	
The student rubs the injection site and praises the patient.	10	
TOTAL POINTS	50	

Clinical Procedures Practicum

Bandage Removal

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student chooses the bandage scissors and holds in proper orientation.	10	
The student keeps the blade flat against the body and the tip raised slightly upward in contact with bandage.	10	
The student begins cutting each layer from the distal end moving proximally.	10	
The student gently removes each layer of bandage.	10	
The student notes the status of the unbandaged area and states if it is normal or if there are any problems.	6	
The student cleans up work area.	4	
TOTAL POINTS	50	

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Clinical Procedures Practicum

Filling a Syringe for Injection

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student determines the amount to be placed in the syringe.	6	
The student selects the proper-sized syringe.	8	
The student inserts the syringe into the top of the bottle.	6	
The student places the bottle upside down in one hand and holds securely.	6	
The student withdraws the proper volume.	6	
The student removes the syringe from the bottle.	6	
The student gently taps or snaps the edge of the syringe to remove any air bubbles, or slightly expel the air by pushing the end of the plunger.	6	
The student places syringe in the sharps container.	6	
TOTAL POINTS	50	

Clinical Procedures Practicum

Fecal Flotation with Fecalyzer

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student selected about ¼ teaspoon of feces and placed it into a fecalyzer.	6	
The student added enough flotation solution to fill the fecalyzer about half full.	6	
The student mixed the feces into solution until no large fecal particles remain.	6	
The student places insert into fecalyzer.	6	
The student filled the vial with more solution until there was a visible meniscus at the top.	6	
The student placed a cover slip on top of the fecalyzer.	6	
The student allowed the vial to sit undisturbed for 10-15 minutes.	6	
The student carefully removed the cover slip without tilting it and placed it on a microscope slide.	8	
TOTAL POINTS	50	

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Clinical Procedures Practicum

Opening a Surgery Pack

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student placed the surgery pack on a clean, dry surface.	4	
The student removed or tore the tape securing the package.	4	
The student opened the first flap away from them.	8	
The student opens the side flaps without reaching across open pack.	8	
The student opens the last flap towards them.	8	
The student opened the pack without contamination.	12	
The student stepped away so the surgeon or scrub nurse could complete the opening of the pack.	6	
TOTAL POINTS	50	

Clinical Procedures Practicum

Prepare a Surgical Pack for Sterilization

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student gathered the appropriate instruments and instrument pan if applicable.	5	
The student gathered additional supplies if applicable.	10	
The student selected the appropriate packaging material and chemical indicator.	10	
The student assembled the pack correctly by following the instructions on the checklist or recipe.	10	
The student placed the chemical indicator in the correct area of the pack.	10	
The student properly wrapped, secured and labeled the pack.	5	
TOTAL POINTS	**50**	

Clinical Procedures Practicum

Surgical Site Preparation

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student applied antiseptic scrub to clipped area.	8	
The student prepped the clipped area with a clean surgical sponge beginning at the incision site moving in a circular motion and worked toward the edges.	8	
The student did not bring the sponge back to the incision site once it was moved away from the incision site.	8	
The student discarded the sponge once it reached the edge of the clipped area.	8	
The student wiped the clipped area with a rinse solution using a clean surgical sponge following the same pattern as when scrubbing with the antiseptic.	8	
The student repeated the scrub and rinse a minimum of three times or until the final rinse sponge was clean.	10	
TOTAL POINTS	50	

Clinical Procedures Practicum

Prescription Filling

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student reads and verbally interprets prescription.	10	
The student selects the correct drug and concentration.	20	
The student places the pill counting tray on the pharmacy counter with the channel to the left and the open plate in front of him/her.	1	
The student pours the medication tablets or capsules onto the tray plate.	1	
The student opens the channel cover.	1	
The student uses a spatula or tongue depressor to push groups of tablets or capsules into the channel.	1	
When the student has counted the desired amount of medication, he/she closes the channel cover. The student tilts the tray to return the unused medicine in to the stock bottle.	4	
The student lifts the tray to place the channel spout into the medicine vial and transfers medication.	4	
The student places the lid on the vial and sets it on the counter/	1	
The student appropriately fills out label with prescription information.	7	
TOTAL POINTS	50	

Clinical Procedures Practicum

Removal of Sutures

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student clearly visualized and inspected the incision site.	10	
If there were problems with the incision site, the student informed the veterinarian. If there were no problems, the student removed the sutures.	10	
The student chose the correct tool to remove the sutures.	10	
The student placed the curved blade underneath the suture for removal and removed the suture.	15	
The student did not cause unnecessary harm or discomfort to the patient.	5	
TOTAL POINTS	50	

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Clinical Procedures Practicum

Administer Oral Tablet/Capsule

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student reads and interprets the veterinarian's order.	10	
The student selects the correct drug and concentration.	20	
The student was able to open the mouth of the animal.	5	
The student maintained control of the head or muzzle during the administration of the medication.	5	
The student used an appropriate technique to encourage the patient to swallow.	5	
The student was able to control the animal in a manner that was adequate to administer the medication yet did no harm to the patient.	5	
TOTAL POINTS	50	

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Handling and Restraining Practicum

Removing a Cat from a Cage and Placing in Cat Bag

NAME

CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student opens the cage door and calls the cat by name.	2	
The student scruffs the cat with one hand and lifts it up.	3	
The student cradles the cat's abdomen with their other hand and removes the cat from the cage.	2	
With the cat still scruffed, the student places the cat under one arm close to their body and closes the cage door with their free hand.	3	
The student carries the cat close to their body to the exam table.	3	
The student scruffs the cat and lifts it into the bag in one swift motion while supporting the hind end.	4	
The student wraps the Velcro strap around the cat's neck and immediately zips up the bag.	4	
The student uses the proper zippered opening to expose the front limb.	4	
To remove the cat, the student removes the Velcro strap first, then unzips the bag and removes the cat by scruffing and supports hind end.	5	
TOTAL POINTS	**30**	

NEW JERSEY FFA
CAREER AND LEADERSHIP
DEVELOPMENT EVENTS

Handling and Restraining Practicum

Applying a Cat Muzzle

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student opens the cage door and calls the cat by name.	2	
The student scruffs the cat with one hand and lifts it up.	2	
The student cradles the cat's abdomen with their other hand and removes the cat from the cage.	2	
With the cat still scruffed, the student places the cat under one arm close to their body and closes the cage door with their free hand.	2	
The student places cat on table.	2	
The student selects a muzzle of appropriate size for the cat.	5	
The student places the cat in sitting or sternal position on exam table.	2	
The student positions the muzzle properly in his/her hands.	3	
The student approaches the cat from behind with the muzzle in both hands while another person restrains cat.	3	
The student brings the muzzle up to the cat's face in one swift motion.	4	
The student secures the muzzle.	3	
TOTAL POINTS	**30**	

Handling and Restraining Practicum

Restraint of the Cat in Lateral Recumbency for Femoral Venipuncture

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student places the cat on an examination table.	3	
The student scruffs the cat with one hand and lifts it off of the table enough to grasp both hind legs with his/her other hand or reach under cat to grasp both hind limbs.	8	
The student lays the cat on its side with the hind legs stretched rearward.	7	
The student tucks top rear leg and tail while occluding with side of hand.	8	
The student spoke to the patient in a calm and affectionate manner during the procedure.	4	
TOTAL POINTS	**30**	

NEW JERSEY FFA
CAREER AND LEADERSHIP
DEVELOPMENT EVENTS

Handling and Restraining Practicum

Restraint of the Cat for Jugular Venipuncture

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student places the cat in sternal recumbency with its chest close to the edge of the table.	6	
The student controls and lifts the head up by placing thumb and forefingers over top of head, fingers firm on zygomatic arches (below eyes).	7	
The student's other hand grasps the front legs and extends them down off the edge of the table.	7	
The student uses arm and elbow to restrain the cat's body close to the student's body.	6	
The student spoke to the patient in a calm and affectionate manner during the procedure.	4	
TOTAL POINTS	**30**	

NEW JERSEY FFA

CAREER AND LEADERSHIP
DEVELOPMENT EVENTS

Handling and Restraining Practicum

Restraint of the Dog for Cephalic Venipuncture

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student places a noose leash on the dog.	2	
The student restrains the dog in sternal recumbency.	5	
The student stands on the dog's right side; wrapping his/her right arm around the dog's neck.	5	
The student holds the dog's left forelimb with elbow in the palm of his/her hand; extend the limb forward toward the person performing the procedure.	6	
With the elbow of the dog in his/her palm, the student rotates his/her thumb up so it is on top of the limb at the bend of the elbow.	6	
The student occludes the vessel with the thumb, rotates the thumb laterally.	6	
TOTAL POINTS	**30**	

Handling and Restraining Practicum

Applying a Dog Muzzle

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student selects proper type of material and length.	4	
The student places the dog in sitting or sternal position on exam table or floor.	2	
The student makes a loop in the gauze and approaches the dog from behind.	6	
The student places the loop on the dog's face with the tie on top.	6	
The student quickly tightens the loop, and then crosses the ends under the dog's face.	6	
The student brings the ends back behind the dog's head under the ears and ties in a quick-release bow.	6	
TOTAL POINTS	**30**	

NEW JERSEY FFA
CAREER AND LEADERSHIP
DEVELOPMENT EVENTS

Handling and Restraining Practicum

Applying a Nylon Dog Muzzle

_____ _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student selects appropriate muzzle.	4	
The student places the dog in sitting or sternal position on exam table or floor.	2	
The student comes from behind the dog's head with the muzzle in one hand in the correct position.	7	
The student brings the muzzle up to the dog's face and slips it on while grasping the strap with the other hand.	6	
The student secures the muzzle.	5	
The student checks for proper fit (one finger inserted under the strap).	6	
TOTAL POINTS	**30**	

NEW JERSEY FFA
**CAREER AND LEADERSHIP
DEVELOPMENT EVENTS**

Handling and Restraining Practicum

Removing Dog from Floor Level Cage to Restrain for Lateral Saphenous Venipuncture

NAME _____   CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student places a leash in one hand with a large loop open in the correct position (in the "P") and ready to place over the dog's head.	2	
While blocking the opening, the student opens the cage door enough to slip the hand holding the leash into the cage.	2	
The student slips the leash over the neck of the dog and gently tightens the leash around the neck.	2	
The student opens the door and allows the dog to exit the cage.	1	
The student lifts the dog and places on the table.	1	
The student places his/her right arm across the dog's neck and reaches between the front legs to grasp the dog's right forelimb in right hand.	4	
The student places left arm over the dog's back and reaches for the dog's right rear limb; just proximal to the hock.	5	
With the dog's body close, the student gently lifts the limbs while allowing the dog's body to lay on the table; the dog should be on its right side.	5	
The student allows the dog to relax for a couple seconds, not releasing the grasp on the limbs.	3	
The student uses left hand to hold the limb tightly in the area just distal to the stifle, which will occlude the vein.	5	
TOTAL POINTS	**30**	

NEW JERSEY FFA

CAREER AND LEADERSHIP DEVELOPMENT EVENTS

Handling and Restraining Practicum

Restraint of the Small Dog for Jugular Venipuncture

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student puts a noose leash on the dog and has the dog sit.	3	
The student places one arm around the dog's neck and places the other arm around the dog's back to grasp the forelimbs.	6	
The student pushes the dog's back with his/her body to encourage the dog to lie down.	6	
The student holds the head up under the jaw, away from the chest (can be achieved by cupping hand underneath the muzzle and by pushing the head upward.)	8	
The student's other hand grasps the front legs and extends them over the end of the table.	7	
TOTAL POINTS	**30**	

NEW JERSEY FFA
CAREER AND LEADERSHIP
DEVELOPMENT EVENTS

Handling and Restraining Practicum

Restraint of the Small Dog for Cephalic Venipuncture

NAME _____ CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student places a noose leash on the dog.	2	
The student restrains the dog in sternal recumbency.	5	
The student stands on the dog's right side; wrapping his/her right arm around the dog's neck.	5	
The student holds the dog's left forelimb with elbow in the palm of his/her hand; extend the limb forward toward the person performing the procedure.	6	
With the elbow of the dog in his/her palm, the student rotates his/her thumb up so it is on top of the limb at the bend of the elbow.	6	
The student occludes the vessel with the thumb, rotates the thumb laterally.	6	
TOTAL POINTS	**30**	

Handling and Restraining Practicum
Restraint of a Rabbit

NAME _____ CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student approaches the rabbit calmly and quietly.	4	
The student scruffs the rabbit with one hand while gently lifting the front end.	6	
The student's other hand immediately reaches under the hind limbs and holds them (not allowing the hind limbs to dangle).	7	
The student rests the rabbit's body on the arm with the hand holding the hind limbs.	6	
The scruffing hold is released and the hand is moved to hold the rabbit's outside front leg.	7	
TOTAL POINTS	**30**	

NEW JERSEY FFA

**CAREER AND LEADERSHIP
DEVELOPMENT EVENTS**

Handling and Restraining Practicum

Haltering Ruminants

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
Without quick movements and loud noises, the student properly approaches the patient at a 45 degree angle to the patient's left shoulder.	5	
The student places crown piece of halter over ears, then slips nose through nosepiece.	6	
The student properly adjusts the halter such that the nose band crosses over bridge of nose halfway between the nostrils and eyes.	7	
The student ensures that the adjustable portion of the nose band is under the chin, not across the bridge of the nose.	6	
The student keeps the standing end or lead rope portion on the left side of the cow.	6	
TOTAL POINTS	**30**	

Handling and Restraining Practicum

Haltering a Horse

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
Without quick movements and loud noises, the student properly approaches the patient at a 45-degree angle to the patient's left shoulder.	5	
The student places end of the lead rope over the horse's neck and passes sufficient length of lead to form a handheld loop around the horse's neck.	5	
Holding the handheld loop in their right hand, with their left hand, the student slip the nose-band of the halter over the nose.	5	
Student releases the lead rope and with their right hand under the horse's neck, the student passes the crown strap over the head and behind the ears and attaches the end to the appropriate place on the halter.	5	
The student snaps the end of the lead to the lead ring of the halter and undrapes the lead rope from the horse's neck.	4	
TOTAL POINTS	**30**	

Handling and Restraining Practicum
Placing a Tail Tie

_____   _____
NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student lays the rope over the tail at the tip of the tail bone.	6	
The student folds all the tail hairs up over the rope.	6	
The student passes the short end of the rope behind the tail, and makes a fold or bight in it.	6	
The student passes the fold or bight over the folded tail and under the rope, which is looped around the tail.	6	
The student pulls tight.	6	
TOTAL POINTS	**30**	

Handling and Restraining Practicum

Applying Elizabethan Collar

NAME   CHAPTER

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student chooses the correct size of E-collar for the patient.	6	
The student correctly prepared the E-collar for placement.	6	
The student correctly placed the E-collar on the animal.	6	
Placement was adequately secured so the animal could not remove the E-collar.	6	
The E-collar was secured such that the animal's breathing was not restricted.	6	
TOTAL POINTS	**30**	

Handling and Restraining Practicum

Snare Restraint of the Pig

NAME _____ CHAPTER _____

Participant must talk through practicum steps with judge.

Criteria	Points Possible	Points Earned
The student, standing next to the patient, guided the loop of the snare into the mouth and over the nose or upper jaw	4	
The student made sure the loop is inserted far enough into the patient's mouth	5	
The student pulled the loop tight when it is in the proper position	5	
The student kept the loop tight while moving to the front of the patient	5	
The student maintained the pressure on the snare so that the patient could not escape.	5	
The student kept control of the patient until the patient ceased to struggle.	4	
The student released the patient after the procedure was completed	2	
TOTAL POINTS	**30**	

NEW JERSEY FFA
CAREER AND LEADERSHIP
DEVELOPMENT EVENTS

Agricultural, Food and Natural Resources Content 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.	Team Activity, Annual Practicum – Waste Management	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.	Team Activity, Annual Practicum – Waste Management	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	Team Activity, Data Analysis, Annual Practicums – Water, Soil, Waste Management	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.	Team Activity, Annual Practicums – Water, Soil, Waste Management	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.	Team Activity, Data Analysis, Annual Practicums – Water, Gps, Soil and Waste Management	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.	Team Activity And Data Analysis	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.	Written Exam, Team Activity – Water and Waste Management, Data Analysis – Soil and Gps	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.	Written Exam, Team Activity – Data Analysis – Soil and Gps	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.).	Written Exam, Team Activity – Water and Waste Management, Data Analysis – Soil and Gps	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.	Written Exam, Team Activity – Water and Waste Management, Data Analysis – Soil and Gps	HS.LS4-6
AS.08.02.02.b. Implement and evaluate the effectiveness of methods to ensure optimal environmental conditions for animals.	Written Exam, Team Activity – Water and Waste Management, Data Analysis – Soil and Gps	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 and Written Exam	HS.LS4-6

Agriculture, Food and Natural Resources Content Standards continued

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 and Waste Management	CCSS.ELA-Literacy.RST.9-10.4 CCSS.ELA-Literacy.RST.11-12.4

Agriculture, Food and Natural Resources Content Standards continued

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.	Team Activity, Data Analysis	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

Agriculture, Food and Natural Resources Content Standards continued

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. **Team Activity**		
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. **Team Activity**		
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**		

Agriculture, Food and Natural Resources Content Standards continued

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, Waste Management, Soil Management	
CS.02.01.01.c. Evaluate geographic data and select necessary data sets to solve problems within AFNR systems.	Gps, Waste Management, Soil 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 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.	Team Activity, Data Analysis	
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

Agriculture, Food and Natural Resources Content Standards continued

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.).	Team Activity, Data Analysis, 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.	Team Activity, Data Analysis, 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.).	Team Activity, Data Analysis, 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.	Team Activity, Data Analysis, 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.).	Team Activity, Written Exam, Data Analysis	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	

Agriculture, Food and Natural Resources Content Standards continued

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.	Team Activity, Data	
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	
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.	Water Analysis, Gps	

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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.	Water Analysis, Gps, Soils Management	
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.	Team Activity, Data Analysis	
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	

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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.	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.	Team Activity, Soils Analysis, Data Analysis, 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

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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.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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

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ESS.03.02.04.b. Assess precautions taken to prevent or reduce contamination of groundwater supplies.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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.	Team Activity, Soils Analysis, Data Analysis, 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

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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.	Team Activity, Soils Analysis, Data Analysis, 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.	Water Analysis, Data Analysis, Soil 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.	Water Analysis, Data Analysis, Soil 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.	Water Analysis, Data Analysis, Soil 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 it's impact on considerations in environmental service systems.	Water Analysis, Data Analysis, Soil 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

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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.	Team Activity, Exam, Data Analysis, Soils 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.c. Evaluate the services provided by types of wetlands and predict how different types of wetlands respond to pressures due to human activity.	Team Activity, Exam, Data Analysis, Soils 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.03.04. 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.	Team Activity, Soils 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.03.04.02.c. Develop strategies for negating air pollutants based on soil microbial populations (e.g., carbon sequestration and rates of decomposition).	Team Activity, Soils 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

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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.	Team Activity, Soils Analysis, 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 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.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

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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

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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.	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

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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	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

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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

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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.	Team Activity, Data Analysis, 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.	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

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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.).	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 A **NRS.01.01.03.a.** Summarize and classify different kinds of living species based on evolutionary traits.	Exam 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.01.01.03.b. Analyze how biodiversity develops through evolution, natural selection and adaptation; assess the importance of biodiversity to ecosystem function and availability of natural resources.	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

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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

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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

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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.	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.	Team Soils	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

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NRS.01.04.01.c. Evaluate and defend the importance of watersheds to ecosystem function.	Team Soils	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. Asses 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

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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, 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

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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

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NRS.01.05.04.c. Devise a soil management plan to minimize erosion and maximize biodiversity, plant productivity, and the formation of topsoil.	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.01.06. 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

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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

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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

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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

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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.	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 NRS.02.03.03.c. Anticipate and predict how future technological advancements may affect the use and views of natural resources.	Team Activity, Waste Management	AFNR Career Cluster, Statement 7

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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 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

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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

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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, Waste Management, Team Activity	
NRS.03.02.02.b. Analyze how an area's natural resources could be assessed using GIS technology.	Gps, Data Analysis	
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. Waste Management,	Team Activity	

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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.	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.	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

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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.	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

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NRS.04.01.04.b. Assess method of rangeland improvement.	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.	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.	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

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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

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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.	Exam	
NRS.04.04.01.c. Develop a prevention plan for harmful fires for a particular region.	Team Activity	
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.	Soil Management Practicum, Exam	
PS.01.02.02.c. Determine the hydraulic conductivity for soil and how the results influence irrigation practices.	Soils Management Practicum	

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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.).	Exam, Identification	
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	

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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 processed 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
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	

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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	

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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	

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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.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	