

Natural Resource Science 2

Exam Information	Description														
Exam number 173 Items 43 Points 46 Prerequisites Natural Resource Science 1 Recommended course length One Year National Career Cluster Agriculture, Food & Natural Resources Performance standards Included (Optional) Certificate available Yes	<p>The Natural Resource Science 2 industry certification exam assesses knowledge and skills related to the biological, environmental, and economic importance of renewable natural resources. Learners demonstrate their understanding of forest and range products and their benefits, with an emphasis on field and laboratory experiences.</p>														
	Exam Blueprint														
	<table> <tr> <th>Standard</th><th>Percentage of exam</th></tr> <tr> <td>1. Student Organizations in Agricultural Education (Optional)</td><td>0%</td></tr> <tr> <td>2. Supervised Agricultural Experience Programs</td><td>6%</td></tr> <tr> <td>3. Effective Methods of Communication</td><td>6%</td></tr> <tr> <td>4. Interrelationships Between Natural Resources and Humans</td><td>22%</td></tr> <tr> <td>5. Natural Resource Management</td><td>56%</td></tr> <tr> <td>6. Basic Economic Principles</td><td>10%</td></tr> </table>	Standard	Percentage of exam	1. Student Organizations in Agricultural Education (Optional)	0%	2. Supervised Agricultural Experience Programs	6%	3. Effective Methods of Communication	6%	4. Interrelationships Between Natural Resources and Humans	22%	5. Natural Resource Management	56%	6. Basic Economic Principles	10%
Standard	Percentage of exam														
1. Student Organizations in Agricultural Education (Optional)	0%														
2. Supervised Agricultural Experience Programs	6%														
3. Effective Methods of Communication	6%														
4. Interrelationships Between Natural Resources and Humans	22%														
5. Natural Resource Management	56%														
6. Basic Economic Principles	10%														

Standard 1

Students will explain the role of student organizations in agricultural education.

Objective 1 Assess the role of student organization participation in developing career skills.

1. List and describe proficiency awards appropriate for natural resources.
2. List and describe career development events appropriate for natural resources.
3. Relate the importance of supervised agricultural experience to student organization achievement.
4. Utilize student organization and supervised agricultural experience participation to gain advanced degrees of student organization membership.

Standard 1 Performance Evaluation included below (Optional)

Standard 2

Students will explain the maintenance and expansion of supervised agricultural experience (SAE) programs in agricultural education.

Objective 1 Maintain and use SAE records.

1. Explain how SAE records are maintained from year to year.
2. Explain how to summarize and analyze SAE records.

Objective 2 Devise long-range plans for expanding SAE programs.

1. Evaluate the overall quality of a current SAE and determine how to make it more productive or profitable.
2. Explain factors that should be considered in expanding an SAE program.
3. Explain how placement and ownership of SAE programs may be expanded.

Standard 2 Performance Evaluation included below (Optional)

Standard 3

Students will use effective methods and venues to communicate natural resource processes to the public.

Objective 1 Communicate natural resource information to the public.

1. Describe the characteristics and importance of active and passive listening.
2. Demonstrate public speaking skills.
3. Read, comprehend, and interpret technical materials/publications.
4. Produce a technical report/research paper.
5. Identify ways a message regarding natural resources may be communicated to the public; such as printed publications, public hearings, media outlets, etc.
6. Design and construct a display that communicates a natural resource topic.
7. Prepare and present a natural resources issues forum for the local community.

Standard 3 Performance Evaluation included below (Optional)

Standard 4

Students will explain the interrelationships between natural resources and humans in managing natural environments.

Objective 1 Identify and evaluate natural resources.

1. Select and assess a natural resource issue with regional/local impact; research its history and discuss its impact
2. Explain the effects and/or trade-off of population growth, greater energy consumption, and increased technology and development on natural resources and the environment.

Objective 2 Examine the relationship between natural resources and society, including conflict management.

1. Assess the responsibility of individuals in stewardship of the environment.
2. Describe procedures and laws for public involvement in natural resource management.
3. Examine the principles of risk assessment and how they are applied to decision-making and adaptive management.
4. Describe the effects of technology and biotechnology on the environment.
5. Research and debate one or more current issues related to the conservation or preservation of natural resources.
6. Identify issues involving the mitigation of natural resources

Objective 3 Compare and contrast the impact of conventional and alternative energy sources on the environment.

1. Identify conventional and alternative energy sources.
2. Compare and contrast baseload versus intermittent energy sources.
3. Identify the advantages and disadvantages of conventional and alternative energy sources.
4. Compare and contrast various energy resources in terms of their reserves, uses, and impacts on the environment.

Standard 4 Performance Evaluation included below (Optional)

Standard 5

Students will explain practices in natural resource management.

Objective 1 Apply soil science principles to natural resource management.

1. Describe soil degradation
2. Identify causes of soil erosion
3. Apply management practices to mitigate soil erosion.

Objective 2 Relate the function of watersheds and water resources to natural resources.

1. Describe the properties of watersheds and identify the boundaries of local watersheds.
2. Compare watershed management methods.
3. Examine the impact of watershed management on local communities.
4. Explain the potential water-holding/runoff capacity of a watershed.
5. Identify water sources and quality standards. Terms: potable water, brackish water, marine water, gray water, etc.
6. Conduct water quality tests.
7. Identify sources of groundwater contamination such as effluent, etc.
8. Describe the functions of wetlands and differentiate types of wetlands.
9. Explain the importance of wetland management, creation, enhancement, and restoration programs.
10. Explain the importance of water distribution.

Objective 3 Analyze wildlife/aquatic resources and management.

1. Describe characteristics of a healthy wildlife habitat.
2. Explain methods of wildlife habitat improvement.
3. Identify wildlife species that can be sustainably harvested.
4. Describe techniques used in managing wildlife.
5. Identify characteristics of a healthy aquatic habitat.
6. Describe techniques used in managing fish populations.
7. Identify and manage fish diseases.
8. Describe the difference between consumptive use and non-consumptive use

Objective 4 Examine forest resources and management.

1. Identify local forestry species by common and scientific names.
2. Describe forest ecology and identify characteristics of a healthy forest.
3. Recognize the importance of forests.
4. Describe the growth and decline of forest trees.
5. Identify ways in which forest stands may be improved.
6. Measure trees and timber stands.
7. Explain the role of fire in forest management.
8. Examine reforestation practices.
9. Identify forest products and uses.
10. Define urban forestry.

Objective 5 Examine mineral resources and management.

1. Identify local mineral resources.
2. Describe the importance of mineral resources to society.
3. Explain the various practices for obtaining mineral resources.
4. Describe the impact of mining practices on the environment.
5. Identify processes for reclaiming areas where minerals have been extracted.

Objective 6 Explain the management of natural resources for recreational purposes.

1. Identify natural resource characteristics desirable for recreational purposes.
2. Identify outdoor recreational enterprises.
3. Describe natural resource management techniques for improving recreation opportunities.
4. Compare various recreational uses of the region.

Objective 7 Explain inventory and monitoring methods.

1. Identify the components of a monitoring plan; objectives, process, and evaluation.
2. Compare and contrast the various inventory/sampling methodologies. (e.g., population estimation)
3. Develop a basic plan for monitoring a natural resource project.

Standard 5 Performance Evaluation included below (Optional)

Standard 6

Students will apply basic economic principles in natural resource business and management.

Objective 1 Apply basic economic principles in natural resource business and management.

1. Monitor monthly financial statements.
2. Apply tax strategies and estate planning to natural resource management.
3. Explain how economic principles contribute to land management through conservation easements and land swaps.
4. Evaluate the economic impact of natural resources on a community.

Standard 6 Performance Evaluation included below (Optional)

Natural Resource Science 2

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of 8 or higher on the rating scale. Students may be encouraged to repeat the objectives until they average 8 or higher.

Student's Name: _____

Class: _____

Performance standards rating scale

0	Limited skills	2	→	4	Moderate skills	6	→	8	High skills	10
---	----------------	---	---	---	-----------------	---	---	---	-------------	----

Standard 1 – Student Organizations in Agricultural Education

Score:

- Attend a student organization meeting

Standard 2 – Supervised Agricultural Experience Programs

Score:

- Develop short and long-range SAE goals
- In an approved record book, record all transactions and activities on an SAE
- Develop short and long-range leadership and person development goals

Standard 3 – Effective Methods of Communication

Score:

- Demonstrate public speaking skills

Standard 4 – Human and Natural Resource Relationship

Score:

- Identify four personal values and explain how these values affect behavior and choices.
- Research a Human Services career that includes educational requirements, skill development, and income potential.
- Will practice communication skills through public speaking using one or more of the following activities: memorized speech, prepared speech, extemporaneous speech, parliamentary practice, group presentation, or serving in a leadership capacity.

Standard 5 – Natural Resource Management

Score:

- Compare and contrast various energy resources, their reserves, use and impacts (i.e., solar, nuclear, hydro, geothermal, wind, waves, coal, gas, etc.)
- Investigate the economics of recreational uses in the region
- Compare management techniques for recreational uses in the region
- Compare forest products, their ownership, and their economic impact on the region (i.e., timber, recreation, wildlife, range/grazing, urban forestry, small woodlot owners etc.)
- Develop a basic plan for monitoring a natural resource project
- Classify and identify indigenous wildlife species and their habitat needs
- Monitor wildlife habitat quality and quantity
- Assess agriculture's impact on the environment through waste generation (i.e., animal waste, pesticide residue, fertilizer runoff, sedimentation/erosion, odors/dust, etc.)

Performance standard average score:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____