



Natural Resource Science II

EXAM INFORMATION

Items

56

Points

56

Prerequisites

NATURAL RESOURCE SCIENCE I

Grade Level

10-12

Course Length

ONE YEAR

Career Cluster

AGRICULTURE, FOOD AND NATURAL
RESOURCES

Performance Standards

INCLUDED

Certificate Available

YES

DESCRIPTION

Students will demonstrate knowledge and skills related to the biological, environmental, and economic importance of renewable natural resources. Forest and range products and their benefits are included.

EXAM BLUEPRINT

STANDARD

PERCENTAGE OF EXAM

1- Student Organizations in Agricultural Education	2%
2- Agricultural Experience in Agricultural Education	2%
3- Effective Methods of Communication	27%
4- Human and Natural Resource Relationship	64%
5- Natural Resource Management	5%
6- Basic Economic Principles (Optional)	



STANDARD 1

STUDENTS WILL DEVELOP PERSONAL, LEADERSHIP, AND CAREER SKILLS THROUGH STUDENT ORGANIZATION PARTICIPATION

- Objective 1** Assess the role of student organization participation in developing personal and leadership skills.
1. Identify important personal skills and the strategies to use in developing the skills.
 2. Identify important leadership skills and the role of student organization participation in developing the skills.
- Objective 2** 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 PROGRAMS IN AGRICULTURAL EDUCATION

- Objective 1** Maintain and use agricultural experience records.
1. Explain how agricultural experience records are maintained from year to year.
 2. Explain how to summarize and analyze agricultural experience records.
- Objective 2** Devise long-range plans for expanding agricultural experience programs.
1. Evaluate the overall quality of a current agricultural experience and determine how to make it more productive or profitable.
 2. Explain factors that should be considered in expanding an agricultural experience program.
 3. Explain how placement and ownership agricultural experience 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 in which a message regarding natural resources may be communicated to the public.
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 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 mitigation of natural resources.

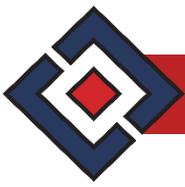
Objective 3 Compare and contrast the impact of conventional and alternative energy sources on the environment.

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

Objective 4 Investigate air resources.

1. Identify components and structural layers of the earth's atmosphere.
2. Identify sources of air pollution.
3. Describe the effects of air pollution on people and their environment.
4. Illustrate the formation of acid precipitation and explain its impact 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 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.
6. Conduct water quality tests.
7. Identify sources of groundwater contamination.
8. Describe the functions of wetlands and differentiate types of wetlands.
9. Explain the importance of wetland management, creation, enhancement, and restoration programs.

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.

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.
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)

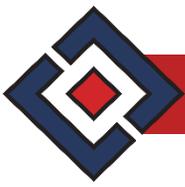
STANDARD 6 (Optional)

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.



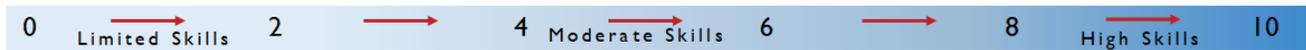
Natural Resource Science II Performance Standards (Optional)

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**.

Students Name _____

Class _____

PERFORMANCE RATING SCALE



STANDARD 1 Student Organization in Agricultural Education

Score:

- Attend a student organization meeting

STANDARD 2 Agricultural Experience in Agricultural Education

Score:

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

STANDARD 3 Communication of Natural Resource

Score:

- Demonstrate public speaking skills

STANDARD 4 Interrelationships between Humans and Natural Resources

Score:

- Participate in a conflict management activity

STANDARD 5 Natural Resource Management Practices

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
- 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: