



EXAM INFORMATION

Exam Number

MN101

Items

54

Points

62

Prerequisites

NONE

Recommended Course Length

ONE YEAR

National Career Cluster

AGRICULTURE, FOOD & NATURAL
RESOURCES

Performance Standards

NO

Certificate Available

NO

DESCRIPTION

Students will demonstrate knowledge and skills related to management, conservation, and importance of natural resources. Major units will include ecology, soils, water resources, wildlife, recreation, and forest resources.

EXAM BLUEPRINT

STANDARD

PERCENTAGE OF EXAM

1 – Natural Resource Science and Management	16%
2 – Ecological Concepts and Science Principles	28%
3 – Land Classification, Resource Inventories, and Monitoring Methods	6%
4 – Communications	2%
5 – Natural Resources and Human Interrelationships	12%
6 – Biotic Factors	22%
7 – Abiotic Factors	14%



STANDARD 1

STUDENTS WILL EXAMINE NATURAL RESOURCE SCIENCE AND MANAGEMENT

- Objective 1 Discuss the basics of natural resource science and management.
1. Identify types of natural resources.
 2. Distinguish between renewable and nonrenewable resources.
 3. Explain the difference between inexhaustible and exhaustible resources.
 4. Explain the concept of interdependent relationships.
- Objective 2 Examine the relationship between natural resources and society, including conflict management.
1. Define natural resource management.
 2. Identify and compare major natural resource management agencies and companies in the upper Midwest. (i.e. NRCS, Army Corps of Engineers, etc.)
 3. Describe human demands on natural resources.
 4. Explain natural resource conservation.
 5. Provide examples of multiple uses of natural resources. (e.g., recreation, mining, agriculture, forestry, etc.)
 6. Explore and describe societal issues related to natural resource management.
- Objective 3 Identify career opportunities in natural resource science.
1. Identify and describe the major areas of natural resource science.
 2. Identify career opportunities in natural resource science and determine the education and training they entail.

STANDARD 2

STUDENTS WILL INVESTIGATE ECOLOGICAL CONCEPTS AND SCIENCE PRINCIPLES RELATED TO NATURAL RESOURCE SYSTEMS

- Objective 1 Examine ecology.
1. Define ecosystem and related terms such as species, habitat, community, and populations.
 2. Describe the interdependence of organisms within an ecosystem.
 3. Describe the processes associated with ecological succession.
 4. Explain population ecology, population density, and population dispersion.
 5. Explain the importance of biodiversity.
 6. Explain the process of natural selection.
 7. Use taxonomy keys to identify common plants and animals.
 8. Identify and classify upper Midwest birds and mammals.
 9. Define invasive species and discuss factors that influence the establishment and spread of invasive species.
- Objective 2 Describe biological, physical, and chemical properties of soil.
1. Explain the importance of soil as a life-supporting layer.
 2. Explain the roles of parent material, topography, organisms, time, weathering, and climate in soil formation.
 3. Describe the physical characteristics of soil and the horizons found in a soil profile.



4. Describe the biodiversity found in soil and the contribution of biodiversity to the physical and chemical characteristics of soil.
5. Describe the chemical properties of soil.
6. Explain the characteristics of soil water.

Objective 3

Examine hydrology principles.

1. Describe the movement of water through the hydrologic cycle.
2. Compare and contrast ground water and surface-water flow.
3. Discriminate between point and nonpoint pollution sources.
4. Survey the local area for pollution sources.

STANDARD 3

STUDENTS WILL EXPLAIN LAND CLASSIFICATION, RESOURCE INVENTORIES, AND MONITORING METHODS

Objective 1

Discuss land-use management planning.

1. Describe the interrelationships between land-use planning and natural resources.
2. Identify land uses, capability factors, and land capability classes.
3. Demonstrate how GIS/GPS applies to land-use planning.
4. Use a soil survey to determine the land capability classes for different parcels of land in an area.

Objective 2

Discuss monitoring of land use.

1. Identify the components of a monitoring plan.
2. Discuss the procedures for conducting resource inventories and population studies.
3. Develop and implement a basic plan for monitoring a natural resource project.

STANDARD 4

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 5

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 and sustainability of our natural resources.
 2. Describe procedures and laws for public involvement in natural resource management (Environmental Impact Statement (EIS)).
 3. Research and debate one or more current issues related to the conservation or preservation of natural resources.
 4. 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.

STANDARD 6

STUDENTS WILL EXPLAIN BIOTIC FACTORS IN NATURAL RESOURCE MANAGEMENT

- Objective 1** 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 2** 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 3

- Explain inventory and monitoring methods.
1. Identify the components of an inventory and monitoring plan.
 2. Compare and contrast the various inventory/sampling methodologies (e.g., population estimation).
 3. Develop a basic plan for inventorying and monitoring a natural resource.

STANDARD 7

STUDENTS WILL EXPLAIN ABIOTIC FACTORS 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. 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

- Examine mineral resources and management.
1. Identify local mineral resources.
 2. Describe the importance of mineral resources to society.

Objective 4

- Explain the management of natural resources for recreational purposes.
1. Identify natural resource characteristics desirable for recreational purposes.
 2. Identify outdoor recreational activities that are consumptive and non-consumptive.
 3. Describe natural resource management techniques for improving recreation opportunities.
 4. Compare various recreational uses of the region.