**Test Type:** The Natural Resources Management assessment was developed based on standards used in the State of West Virginia and contains a knowledge-based component. This assessment is meant to measure technical skills at the occupational level and includes items which gauge factual and theoretical knowledge.

**Revision Team:** The assessment content is based on input from West Virginia educators who teach in career and technical education programs.

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**CIP Code**

03.9999 – Natural Resources and Conservation, Other

**Career Cluster 1**

Agriculture, Food & Natural Resources

**11-9121.00**

Natural Sciences Managers
This written assessment consists of questions to measure an individual’s factual theoretical knowledge.

**Administration Time:** 2 hours  
**Number of Questions:** 102  
**Number of Sessions:** This assessment may be administered in one, two, or three sessions.

### Areas Covered

- **Foundations of Agriculture, Food, and Natural Resources:** 39%  
- **Soil and Land Management:** 12%  
- **Water Management:** 13%  
- **Forest Management:** 13%  
- **Wildlife Management:** 11%  
- **Environmental Laws and Government Agencies:** 6%  
- **Agricultural Innovation, Technology, and Entrepreneurship:** 6%
Specific Standards and Competencies Included in this Assessment

Foundations of Agriculture, Food, and Natural Resources
- Demonstrate understanding of agribusiness (e.g., SAE, expenses)
- Demonstrate understanding of animal systems (e.g., breeds of livestock, anatomy)
- Demonstrate understanding of agriculture innovation and technology
- Demonstrate understanding of food products and processing (e.g., protein sources, food preservation)
- Demonstrate understanding of natural resources (e.g., renewable resources)
- Demonstrate understanding of plant systems (e.g., plant parts, processes, soil)
- Demonstrate understanding of power, structural, and technical systems (e.g., measurement)
- Demonstrate knowledge of leadership development through FFA (e.g., motto, parliamentary procedure, official dress)

Soil and Land Management
- Demonstrate understanding of soil erosion and conservation (e.g., horizon, contour planting)
- Exhibit knowledge of spatial tools such as Geographic Information Systems (GIS) and Global Positioning Systems (GPS) and their use in resource management (e.g., satellite links, waypoint)
- Display knowledge of topographic and aerial maps, soil surveys, and soil test results (e.g., benchmark elevation, pH, slope)

Water Management
- Demonstrate understanding of the hydrologic cycle (e.g., water holding capacity, acid rain)
- Exhibit knowledge of watersheds and aquatic ecosystems, (i.e., wetlands, ponds, streams) including wetland functions (e.g., eutrophication, Clean Water Act, water quality)
- Recognize aspects of aquifers and groundwater protection (e.g., soil drainage, manure nutrients)
- Identify point and non-point source pollution (e.g., riparian buffers)

(Continued on the following page)
Forest Management
- Define basic forestry concepts (e.g., site index, tree biology, forest measurements tolerant tree species)
- Display knowledge of dendrology (e.g., simple and compound leaves, samara)
- Recognize and define best management practices in forestry and state BMP regulations (e.g., prescribed burns)

Wildlife Management
- Demonstrate understanding of wildlife management practices (e.g., border cutting, wetland habitat, fall mast production)

Environmental Laws and Government Agencies
- Exhibit knowledge of environmental regulations and laws (e.g., timber management, protection of imperiled species)

Agricultural Innovation, Technology, and Entrepreneurship
- Define and recognize aspects of sustainability (e.g., biodiesel)
- Identify aspects of the impact of international agriculture on U.S. and global natural resources (e.g., cost and availability, entrance of new species into country)
Sample Questions

Agricultural innovations have allowed farmers to
A. eliminate the use of chemical fertilizers
B. increase the use of chemical fertilizers
C. produce more crops on less land
D. produce fewer crops on more land

FFA business meetings are run using an established set of rules known as
A. Business Rules
B. Meeting Rules
C. Parliamentary Procedures
D. Business Procedures

Which kind of erosion removes a thin layer of soil?
A. splash
B. sheet
C. rill
D. gully

Forest wetlands are particularly important habitats for which of the following?
A. fish
B. reptiles
C. amphibians
D. mussels

Biodiesel is an alternative fuel usually made from animal fats or
A. biomass
B. simple sugars
C. vegetable oils
D. starches