Odysseyware®

CURRICULUM OVERVIEW

Introduction to Agriculture Food and Natural Resources

Career and Technical Education Series

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Introduction to Agriculture, Food, and, Natural Resources Course Overview

This semester-length high school elective introduces students to the basic scientific principles of Agriculture and Natural Resources. Students will be recognizing and researching plant systems, animal systems, government policy, “green” technologies, agribusiness principles, and sustainability systems.

In this course, students will apply understanding of ecosystems and systems thinking to the management of natural resources to maximize the health and productivity of the environment, agriculture, and communities. Students will also analyze community practice or policy development related to sustainability in agriculture, food, and natural resources. Communicating the impact of “green” and sustainability principles on agriculture, food, and natural resource systems will also be taught through the course, and students will learn to recognize the social, health, environmental, and economic costs and benefits of renewable energy production (e.g., solar, wind, and biofuels) in comparison to non-renewable energies (e.g., coal, oil, and natural gas).

Analyzing energy usage, renewable energy options, and renewable materials options to promote sustainable practices across AFNR will also be part of the course, and students will learn to use "green" technologies and sustainability practices to maintain safe and healthful working environments that sustain the natural environment and promote well-being in the AFNR workplaces. Students will also demonstrate an understanding of "green" and sustainability trends that are influencing processes and markets in AFNR.

Finally, students will apply adaptive ecosystem management to a common pool resource (e.g., an irrigation system or fishing grounds) problem in a manner that addresses ecological (data, models, concepts, understanding, and scientific responsibilities), socioeconomic (values, interests, information, assets, private sector responsibilities), and institutional (law, policies, authority, assets, public sector responsibilities) contexts.

- **Unit 1: Nature and Scope of AFNR and their Role in Society and Economy:** In this unit, students will learn about the ways that early societies met the people’s need for food and other items. They will also learn about the development of agriculture and about now disputes over agriculture have led to war as well as how war has led to advances in technology that have benefited agriculture. Students will learn about the development of different agricultural equipment, including wooden and metal plows, and the thresher. Sustainable farming practices will also be investigated, as will the complexity of food distribution systems.

- **Unit 2: Agriculture, Food, and Natural Resources and The Environment:** In this unit, students will explore ecosystems, food chains, and the important cycles in nature. They will also examine the impacts of damaging those three things, including direct human causes, chemical causes, and physical causes. Demand on natural resources due to population increases will also be explored, as will how advances in technology have had an impact on both agriculture and natural-resource management. Other topics in this unit cover how historical events have made an impact on the agriculture industry in the United States, sustainable agricultural practices, and the impact of the use of pesticides, herbicides, fungicides, and rodenticides in agriculture and their regulation by the EPA.

- **Unit 3: Safety and Health in Agriculture, Food and Natural Resources Systems:** Safety in the workplace is the theme of this unit. Students will learn about the powers that the Occupational Safety and Health Administration (OSHA) has when it comes to setting guidelines that help ensure a safe working environment, whether it’s a farm field, processing plant, mine, or forest. Students will also learn that workers have rights to safety training and a safe workplace and the ability to exercise their rights without penalty. Students will also explore workplace plans for disasters, such as storms, floods, biological outbreaks, and radiation exposure. Students will also learn about logistics, which is the management of all aspects of moving products from their origin to their destination. They will also explore the federal departments that oversee the transportation of goods.

- **Unit 4: Introduction to Plant Science:** The nature and composition of soil and its role in plants is the foundation for lessons in this unit. Students will explore how soil forms and how it's used. Students will also learn how it can be augmented with fertilizers, and about the composition of fertilizers. Also, in this unit, students will learn about how soil and water can become polluted by both natural and human means, such as agriculture and mining. Students will also explore the parts of plants, and plant reproduction. Plant classification will also be taught, as will the benefits of plants and how they deal with predators.

- **Unit 5: Animal Agriculture:** In this unit, students will learn how animals provide, food, companionship and jobs, and that the purpose of the animal agriculture industry is to raise animals to produce meat, milk, eggs, or other dairy products. Students will explore how farmers and governmental agencies can track farm animals to quickly and easily locate the source of contamination or disease caused by contaminated animal products. Taxonomy, a way that scientists classify living things, will also be explored. Students will also learn about animal genetics, cloning, and the human consumption of cloned meat. Animal behavior will also be explored, as will the different ways that animals are confined, whether in pens or in their natural, free-range environment. The impacts of confinement will also be taught. Protection of animals against cruelty will also be discussed, as will how animal waste is dealt with. Finally, students will explore different careers related to animal care and breeding.

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Unit 1: Nature and Scope of AFNR and Their Role in Society and Economy

Assignments

1. Course Overview
2. People and Agriculture
3. Project: People, Agriculture, and Society
4. Advances in Agriculture
5. Today's Agricultural Consumer
6. Project: Percent Spent
7. Quiz 1: Overview of Agriculture
8. Sustainable Agriculture
9. Project: Research and Learn: The Power of Poo!
10. Agriculture and the Economy
11. Project: Research and Learn: Commodities and Exchanges
12. Food Distribution and Safety
13. Quiz 2: Agriculture's Economic Role in Society
14. Special Project*
15. Test
16. Course Project Part 1: Nature and Scope of AFNR and Its Role in Society and the Economy*
17. Glossary and Credits

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Unit 2: Agriculture, Food and Natural Resources and the Environment

Assignments

1. Environment and Ecosystems
2. Project: Ecosystems in Your Area
3. Soil and Water Quality
4. AFNR and Population Impact on the Environment
5. Project: Current Event: Sustainable practice in agriculture and natural resources
6. Quiz 1: Overview of Environment and Ecosystems
7. Agriculture Personnel Support Systems
8. Green Technologies and Sustainable Agriculture
9. Project: Research and Share: Renewable Energy on the Farm
10. Environmental Impacts
11. Project: Case Study: DDT
12. Quiz 2: Agriculture, Food, and Natural Resources Environmental Practices
13. Special Project*
14. Test
15. Course Project Part 2: Agriculture, Food, and Natural Resources and the Environment*
16. Glossary and Credits

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Unit 3: Safety and Health in Agriculture, Food and Natural Resources Systems

Assignments

1. Risks in Agriculture, Food, and Natural Resources
2. Project: Research and Apply: Writing a Safety Plan
3. Risk Management in Agriculture, Food, and Natural Resources
4. Accident Response and Disaster Planning
5. Project: Investigate and Write: Disaster Plans
6. Quiz 1: Safety in Agriculture, Food, and Natural Resources Industries
7. Harvesting and Extracting Natural Resources
8. Natural Resources Conflict and Conservation
9. Project: Research and Learn: Natural Resource Conservation
10. Moving Natural Resources
11. Project: Case Study: The Negative Impacts from the Transportation Industry
12. Quiz 2: Workplace Health in Agriculture, Food, and Natural Resources
13. Special Project*
14. Test
15. Course Project Part 3: Safety and Health in Agriculture, Food, and Natural Resources Systems*
16. Glossary and Credits

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Unit 4: Introduction to Plant Science

Assignments

1. What Is Soil?
2. Fertilizers and Amendments
3. Project: Understanding Fertilizers
4. Water and Soil
5. Project: Current Event
6. Quiz 1: Soils and the Environment
7. What Is a Plant?
8. Project: What Part Is This? Flower Anatomy
9. Plant Physiology
10. Plant Reproduction, Behavior, and Defenses
11. Project: Research and Learn: Plant Reproduction
12. Quiz 2: Plants and Their Purpose
13. Special Project*
14. Test
15. Course Project Part 4: Introduction to Plant Science*
16. Glossary and Credits

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Unit 5: Animal Agriculture

Assignments

1. Animals in Society
2. Project: Observe and Learn: Animals in Your Life
3. Classification and the Breeding of Animals
4. Animal Behavior and Health
5. Project: Research and Learn: Zoonotic Disease
6. Quiz 1: Introduction to Animal Agriculture
7. Animals and the Environment
8. Project: Problem Solving: Overgrazing
9. Animal Welfare
10. Project: Research and Learn: Animal Welfare Laws
11. Waste Management
12. Quiz 2: Animal Welfare and Animals in the Environment
13. Special Project*
14. Test
15. Course Project Part 5: Animal Agriculture*
16. Glossary and Credits

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Unit 6: Course Project, Review, and Exam

Assignments

1. Course Project Part 6: Protecting Our Future: Sustainable Practices in AFNR*
2. Review
3. Exam

(*) Indicates alternative assignment