

AGRICULTURE AND RESOURCES DEVELOPMENT II CURRICULUM

Unit 1: Agriculture and the FFA Organization

OVERVIEW

Summary

Introduction to Agriculture II will be the second course students enrolled in the Agriculture CTC program will take. Additionally, it is a science elective that is available to the general student population. During Unit 1, students will be introduced to the concept of agriculture and many related fields. They will examine a brief overview of the history of agriculture in the United States as well as an overview of modern agriculture. Additionally, students will register with FFA.org and explore the multitude of resources available to them. Those who were enrolled in Introduction to Agriculture I, will continue to explore and contribute to resources on FFA.org.

Content to Be Learned

- Concept of agriculture and related fields and jobs.
- Brief history of agriculture inventions, innovations and discoveries in the United States.
- Brief history of the FFA Organization.
- FFA motto and creed.
- Structure of the FFA Organization.

Practices

- Construct and revise an explanation describing historically important agricultural inventions and/or discoveries and their impact on modern agriculture.
- Obtain, evaluate, and communicate information regarding the National FFA Organization, the resources it offers to students, and the various awards available to its members.

Crosscutting Concepts

- Cause and effect.
- Influence of science, engineering and technology on society and the natural world.

Essential Questions

- Since 1928, the National FFA Organization has provided students with unequalled preparation for careers in the field of agriculture. How can individual students at Chariho High School better prepare themselves for a successful career and life with the FFA?

Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards

- CS.02.03. Performance Indicator: Professional Growth: Develop awareness and apply skills necessary for achieving career success.
 - CS.02.03.01.a. Explore various career interests/options.
 - CS.02.03.01.b. Make decisions to plan for a personal career.
 - CS.02.03.03.a. Identify the skills required for various careers.
 - CS.02.03.03.b. Develop skills required for a specific career.

Unit 2: FFA Career Development Events

OVERVIEW

Summary

During Unit 2, students will prepare for spring FFA Career Development Events. These events will allow students to potentially earn state, regional, and national honors in the contest areas. This will include but is not limited to the Job Interview CDE, Prepared Public Speaking, Extemporaneous Public Speaking, and Creed Speaking CDE. In addition to preparing for CDE's students will begin or continue to develop an SAE (supervised agricultural experience) project that is relevant to their interests, jobs, and/or life goals. This will be a semester and/or year long project (depending on Ag CTC program status) that will allow students to study a career or component of agriculture in an in-depth manner.

Content to Be Learned

- The expectations of an SAE (supervised agricultural experience).
- The documentation required for the SAE.
- The expectations of a variety of CDE (career development events) that students will participate in during the spring.
- Skills required for CDE competition that include but are not limited to resume writing, public speaking, and job interview skills.

Practices

- Asking questions about what aspects of agriculture interest the individual student to determine the type of SAE they will be developing.
- Planning and carrying out an investigation as part of the students SAE on the agricultural topic of their choosing.
- Obtaining, evaluating, and communicating information regarding the chosen SAE (on-going during the course of the semester or year depending on Ag CTC status).
- Developing and using models to illustrate skills required for CDE competitions.

Crosscutting Concepts

- Cause and effect.

Essential Questions

- What are the skills required for interacting with others in a professional manner and how can those skills be learned and honed in on?

AFNR Career Cluster Content Standards

- CS.01.01. Performance Indicator: Action: Exhibit the skills and competencies needed to achieve a desired result.
 - CS.01.01.04.a. Explore available resources to assist in meeting project needs.
 - CS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.
- CS.03.01. Performance Indicator: Communication: Demonstrate oral, written and verbal skills. Language Arts: 4, 5 and 12
 - CS.03.01.01.a. Use basic technical and business writing skills.
 - CS.03.01.01.b. Select the appropriate form of technical and business writing or communication for a specific situation.
 - CS.03.01.02.a. Describe the various types and uses of resumes. CS.03.01.02.b. Prepare a resume.

Unit 3: Introduction to Plant and Animal Science

OVERVIEW

Summary

In this unit, students will be introduced to the two largest components of the agriculture industry: plants and animals. The unit will be a general introduction to both and will cover the general products produced by each respective industry and organizations that support those products. Students will also examine jobs associated with these facets of the in agriculture industry both locally (within RI) and nationally.

Content to Be Learned

- Animal Industry (products and organizations).
- Plant industry (general products).

Practices

- Obtaining, evaluating, and communicating information regarding products produced by plant and animal agriculture and the organizations that support them.
- Communicating scientific information from the most recent census document regarding the status of agriculture in both RI and the United States in terms of economic impact and the number of jobs available in agriculture.

Crosscutting Concepts

- Cause and effect.
- Systems and system models

Essential Questions

- In terms of agriculture in the United States, what impacts do the plant and animal industries have on

the economy and job availability?

AFNR Career Cluster Content Standards

- AS.01.01. Performance Indicator: Evaluate the development and implications of animal origin, domestication and distribution.
 - AS.01.01.02.a. Define major components of the animal industry.
 - AS.01.01.02.b. Outline the development of the animal industry and the resulting products, services and careers.
- PS.03.05. Performance Indicator: Harvest, handle and store crops.
 - PS.03.05.04.a. Explain the reasons for preparing plants and plant products for distribution.

Unit 4: Plant Science and Greenhouse Management

OVERVIEW

Summary

In Unit 4, students will gain more in-depth knowledge regarding the plant industry and specifically greenhouse management. Students will work in conjunction with Plant Science students to run the greenhouse and prepare for the Chariho FFA Plant Sale. Students will first learn the basics of plant anatomy in order to explain how a plant carries out life and produces leaves, flowers, fruits, and seeds. Additionally, students will receive instruction on important management practices in greenhouse managements. This includes plant propagation techniques that include but are not limited to cuttings, seeds, and dividing. Fertilization will also be addressed as will methods of applying fertilizer will be discussed and demonstrated. Lastly, pest management and control will be addressed. This will include general pest identification and possible treatments.

Content to Be Learned

- General plant anatomy.
- General plant propagation concepts and techniques.
- General greenhouse management concerns - temperature control, pest control, fertilizer application, and irrigation.
- Field experience to observe current greenhouse production techniques.
- Plant and greenhouse management techniques used in the field to own and operate a productive greenhouse.

Practices

- Analyzing and interpreting data generated by the greenhouse (qualitative - temperature and amount of fertilizer; quantitative - overall health of plants, effectiveness of fertilizer applications, etc.)
- Constructing an explanation that indicates how the structure of plants allows them to live and produce leaves, flowers, fruits and seeds.
- Engaging in an argument to explain why each greenhouse maintenance concern is critical to plant health (temperature, fertilizer, pest treatment, etc).
- Asking questions about what can be done in the future to conserve and preserve natural resources.

Crosscutting Concepts

- System and system models.
- Cause and effect.
- Structure and function.

Essential Questions

- How can the components of a well functioning greenhouse work together to allow plants to grow at their optimum rates?

AFNR Career Cluster Content Standards

- PS.01.01. Performance Indicator: Classify agricultural plants according to taxonomy systems.
 - PS.01.01.02.a. Describe the morphological characteristics used to identify agricultural plants.
- PS.01.02. Performance Indicator: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.
 - PS.01.02.02.a. Identify the components, the types and the functions of plant roots.
 - PS.01.02.02.b. Identify root tissues and explain the pathway of water and nutrients into and through the root tissues.
 - PS.01.02.03.a. Identify the components and the functions of plant stems.
 - PS.01.02.04.a. Discuss leaf morphology and the functions of leaves.
 - PS.01.02.05.a. Identify the components of a flower, the functions of a flower and the functions of flower components.
 - PS.01.02.06.a. Explain the functions and components of seeds and fruit.
- PS.01.03. Performance Indicator: Apply knowledge of plant physiology and energy conversion to plant systems.
 - PS.01.03.01.a. Explain the basic process of photosynthesis and its importance to life on Earth.

Next Generation Science Standards

HS-LS1-5 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. (Clarification Statement: Emphasis is on illustrating inputs and outputs of matter and the transfer and transformation of energy in photosynthesis by plants and other photosynthesizing organisms. Examples of models could include diagrams, chemical equations, and conceptual models.) [Assessment Boundary: Assessment does not include specific biochemical steps.]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds. <ul style="list-style-type: none">Use a model based on evidence to illustrate the relationships between systems or between components of a system.	LS1.C: Organization for Matter and Energy Flow in Organisms <ul style="list-style-type: none">The process of photosynthesis converts light energy to stored chemical energy by converting carbon dioxide plus water into sugars plus released oxygen.	Energy and Matter <ul style="list-style-type: none">Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.
Connections to other DCIs in this grade-band: HS.PS1.B ; HS.PS3.B		
Articulation of DCIs across grade-bands: MS.PS1.B ; MS.PS3.D ; MS.LS1.C ; MS.LS2.B		
Common Core State Standards Connections: ELA/Literacy - SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-5)		

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

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Unit 5: Animal Science and Livestock Production

OVERVIEW

Summary

In Unit 5, students will gain more in-depth knowledge of the animal industry with a focus on general management techniques that are used across the industry to care for and produce products from a variety of animals. Students will examine the dairy, poultry (egg and meat), and livestock (beef and pork) industries and look for commonalities in terms of production. Lastly, students will investigate the companion animal/recreational animal industry which includes cats, dogs, rodents, horses, etc. Students will gain insight into the requirements of care for these animals.

Content to Be Learned

- Breed type, Housing, feeding, breeding, and processing concerns and management practices as they relate to the dairy, poultry and livestock industries.
- Companion animal industry overview that includes breeds, feeding, and medical care for these animals.

Practices

- Engaging in argument to convince others of the best breed types for different situations within the different components of the animal industry (ex: high milk volume vs. high milk fat content).
- Obtaining, evaluating, and communicating commonalities within the animal portion of the agriculture industry (dairy, poultry, and livestock).
- Constructing an explanation that demonstrates knowledge of a specific companion animal type that includes information regarding breeds, feeding, and medical care.

Crosscutting Concepts

- Patterns.
- Systems and system models.
- Cause and effect.

Essential Questions

- Since animal products are an essential part of society in the United States, why is it important that the production of these products be streamlined in terms of animal health, housing, breeding, and processing?
- How can companion animals enhance the lives of humans?

AFNR Career Cluster Content Standards

- AS.01.01. Performance Indicator: Evaluate the development and implications of animal origin, domestication and distribution.
 - AS.01.01.02.a. Define major components of the animal industry.
- AS.03.01. Performance Indicator: Prescribe and implement a prevention and treatment program for animal diseases, parasites and other disorders.
 - AS.03.01.01.a. Explain methods of determining animal health and disorders.
- AS.06.02. Performance Indicator: Implement procedures to ensure that animal products are safe.
 - AS.06.02.01.a. Identify animal production practices that could pose health risks or are considered to pose risks by some.
- AS.07.01. Performance Indicator: Design animal housing, equipment and handling facilities for the major systems of animal production.
 - AS.07.01.01.a. Identify facilities needed to house and produce each animal species safely and efficiently.
 - AS.07.01.02.a. Identify equipment and handling facilities used in modern animal production.
- AS.08.02. Performance Indicator: Evaluate the effects of environmental conditions on animals.
 - AS.08.02.01.a. Identify optimal environmental conditions for animals.