

Course Title: Agricultural Science I

Board Approval Date: 11/18/13

Credit / Hours: 1 credit

Course Description:

This course focuses on mastery of the PA Academic Standards for Science and Technology as well as Career Education and Work. As students progress through this course they will participate in a systematic study of a basic understanding of the agricultural industry. As entering this elective program, few students know exactly what career they wish to enter upon graduation from high school. Throughout this course, instruction is provided on many agricultural and agriculturally related aspects of this broad industry. Material being presented in this course is designed to provide a diversity of information to students who in turn can apply these principles to their own individual situations. Information being presented such as: Introduction to the FFA, Careers in Agriculture, Principles of Plant & Animal Sciences, Fundamentals in Arc Welding, Gas Welding and Heating, Woodworking Skills, Leadership Growth and Development, Food and Fiber Industry, Hand Tool Identification and Use, Power and Hand Tool Safety, Shop and Fire Safety, Bill of Materials, Introduction to Agricultural Business, Fasteners, and Agronomy.

Learning Activities / Modes of Assessment:

Large group instruction	Tests and Quizzes
Laboratory/Shop demonstration	Checklists / Teacher Observation
Small group work	Projects with Rubrics
Greenhouse instruction	Lesson Worksheets
Career Pathway Explorations	LFS Worksheets

Instructional Resources:

www.agednet.com
www.pacareerzone.com
FFA Videos
You Tube Videos
Agri-science 4th Edition Text (Burton & Cooper, 2011)
Agricultural Mechanics 6th Edition Text (Herren, 2011)

Course Pacing Guide

Course: Agricultural Science I	
Course Unit (Topic)	Length of Instruction (Days/Periods)
1. FFA	15 days
2. General Shop/Laboratory Safety	5 days
3. Hand and Power Tool Safety	15 days
4. Bill of Materials	15 days
5. Woodworking	27 days
6. Agricultural Careers	7 days
7. Plant Science	20 days
8. Arc Welding	25 days
9. Oxy-Acetylene Torches	12 days
10. Wildlife Management	8 days
11. Forest Management	8 days
12. Agronomy Crops	8 days
13. Food Science	<u>15 days</u>
DAYS TOTAL	180 Days

Topic: A-1-FFA

Days: 15

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>3.4.12.E4. – Compact INFORMATION AND COMMUNICATION TECHNOLOGIES - Synthesize the effects of information and communication systems and subsystems as an integral part of the development of the Information Age.</p> <p>History of the FFA</p> <ul style="list-style-type: none"> • People • Dates and Events • Places • Official Dress • Code of Ethics • Degrees 	<p>Students should understand the structure and involvement of the FFA.</p>	<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>13.1.A – Essential Relate careers to individual interests, abilities, and aptitudes.</p> <p>13.1.F – Essential Analyze the relationship of school subjects, extracurricular activities, and community experiences to career preparation.</p> <p>13.1.H – Essential Choose personal electives and extra curricular activities based upon personal career interests, abilities and academic strengths.</p> <p>Participate in Career Development Events</p> <p>Participate in Chapter/Program Activities</p> <p>Apply for FFA Achievements</p>
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Topic: B-2-General Shop/Laboratory Safety

Days: 5

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p>3.4.12.A1. – Important CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.</p> <p>Safety and Focal Colors</p> <p>Fire Safety</p> <p>Industry Safety Standards</p>	<p>Students should understand the methods, policies and procedures used to ensure that a safe shop working environment is established</p>	<p>3.4.12.A1. – Important CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.</p> <p>13.1.D – Important Explain the relationship of career training programs to employment opportunities.</p> <p>List attitudes and behaviors that could cause a shop accident .</p> <p>Identify the classes of fire and fire extinguishers.</p> <p>Describe the shop safety and focal colors.</p> <p>Utilize safety information and skills when working in the shop.</p>
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Topic: C-3-Hand and Power Tool Safety

Days: 15

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p>3.4.12.A1. – Important CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.</p> <p>Power and Hand Tool Safety Packets</p>	<p>Students should understand and demonstrate the proper use and safety procedures of operating both hand and power tools.</p>	<p>3.4.12.A1. – Important CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.</p> <p>3.4.12.C2. – Essential ENGINEERING DESIGN - Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.</p> <p>13.1.D – Important Explain the relationship of career training programs to employment opportunities.</p> <p>13.3.A – Important Determine attitudes and work habits that support career retention and advancement.</p> <p>Complete safety exams for each power and hand tool</p> <p>Construct a project utilizing power and hand tools</p> <p>Participate in a FFA Career Development Event</p>
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Topic: D-4-Bill of Materials

Days: 15

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>Identify the parts of a bill of materials</p> <p>Complete a measuring activity to determine total cost</p>	<p>Students should understand the procedures utilized to create and apply a bill of materials to a specific project.</p>	<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>13.3.E – Essential Identify and apply time management strategies as they relate to both personal and work situations.</p> <p>Construct a bill of materials for a planned project.</p> <p>Compute the totals in a bill of materials</p>
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Topic: E-5-Woodworking

Days: 27

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p>	<p>Students should understand the steps that need to be used to complete projects</p>	<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>3.4.12.C2. – Essential ENGINEERING DESIGN - Apply the concept that engineering design is influenced by personal characteristics, such as creativity, resourcefulness, and the ability to visualize and think abstractly.</p> <p>13.1.D – Important Explain the relationship of career training programs to employment opportunities.</p> <p>13.3.E – Essential Identify and apply time management strategies as they relate to both personal and work situations.</p> <p>13.3.A – Important Determine attitudes and work habits that support career retention and advancement.</p> <p>Utilize the proper procedures and skills for completing projects. Demonstrate proper work ethic in the laboratory Complete planned projects</p>
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Topic: F-6-Agricultural Careers

Days: 7

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p><u>Career Categories</u></p> <ul style="list-style-type: none"> • Production Agriculture • Environmental Science • Horticulture • Turf/Landscape <p><u>Career Readiness</u></p> <ul style="list-style-type: none"> • Application • Cover Letter • Resume 	<p>Students should understand the connection between career planning, career exploration and achievement</p>	<div style="background-color: #e0f2f1; padding: 5px; margin-bottom: 5px;"> <p>13.1.A – Essential Relate careers to individual interests, abilities, and aptitudes.</p> </div> <div style="background-color: #e0f2f1; padding: 5px; margin-bottom: 5px;"> <p>13.1.B – Essential Relate careers to personal interests, abilities and aptitudes.</p> </div> <div style="background-color: #e0f2f1; padding: 5px; margin-bottom: 5px;"> <p>13.1.H – Essential Choose personal electives and extra curricular activities based upon personal career interests, abilities and academic strengths.</p> </div> <div style="background-color: #fff9c4; padding: 5px; margin-bottom: 5px;"> <p>13.1.D – Important Explain the relationship of career training programs to employment opportunities.</p> </div> <div style="background-color: #fff9c4; padding: 5px; margin-bottom: 5px;"> <p>13.3.A – Important Determine attitudes and work habits that support career retention and advancement.</p> </div> <p>Identify that career interest area</p> <p>Construct an individualized career portfolio</p> <p>Connect the importance of career preparation to career success</p>
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Topic: G-7-Plant Science

Days: 15

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

13.1.C – Important
 Explain how both traditional and nontraditional careers offer or hinder career opportunities.

Students should understand the processes utilized to successfully identify and grow agronomic crops.

3.4.12.E2. – Essential
 AGRICULTURAL AND RELATED BIOTECHNOLOGIES - Compare and contrast the technologies of biotechnology, conservation, bio-fuels, and ecosystems as they relate to managing Earth's resources effectively.

13.1.A – Essential
 Relate careers to individual interests, abilities, and aptitudes.

13.1.D – Important
 Explain the relationship of career training programs to employment opportunities.

13.1.B – Essential
 Relate careers to personal interests, abilities and aptitudes.

Properly identify major agronomic crop plants in Pennsylvania
 Properly identify major agronomic crop seeds in Pennsylvania
 Conduct a grow study of agronomic crops in a controlled atmosphere

Topic: H-8-Arc Welding

Days: 25

Subject(s): Vocations

Grade(s): 9th

Know:

3.4.12.A1. – Important
CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.

3.4.12.E7. – Important
CONSTRUCTION TECHNOLOGIES - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Safety

- Equipment (helmets, jackets, gloves, safety glasses and proper clothing)
- Fire safety

Machine Setup

- Ground Clamp/ Electrode Clamp
- Electrode Selection
- Current and Amperage Selection

Metal Preparation

- Cleaning metal
- Chamfering edges (for butt weld)
- Tack Weld the end

Understand:

Students should understand how to perform basic welds using an electric arc welder that are commonly used in agricultural mechanics.

Do:

3.4.12.A1. – Important
CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.

3.4.12.E7. – Important
CONSTRUCTION TECHNOLOGIES - Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

13.1.A – Essential

Relate careers to individual interests, abilities, and aptitudes.

13.1.B – Essential

Relate careers to personal interests, abilities and aptitudes.

13.1.D – Important

Explain the relationship of career training programs to employment opportunities.

Properly identify safety procedures used in arc welding.

Identify the different welds used in the agricultural mechanics industry.

Properly identify and use tools for arc welding.

Demonstrate the proper safety equipment for MIG welding.

Apply proper machine settings prior to Arc welding.

Prepare metal prior to Arc welding.

Topic: H-8-Arc Welding

Days: 25

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

Welding

- Techniques
- Running Beads
- Butt Welds
- T-Welds
- Corner Welds
- Lap

Topic: I-9-Oxy-Acetylene Torches

Days: 12

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p>3.4.12.A1. – Important CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.</p> <p>3.4.12.C3. – Essential RESEARCH & DEVELOPMENT, INVENTION & INNOVATION, EXPERIMENTATION/PROBLEM SOLVING AND TROUBLESHOOTING - Apply the concept that many technological problems require a multi-disciplinary approach.</p> <p>3.4.12.E6. – Essential MANUFACTURING TECHNOLOGIES - Compare and contrast the importance of science, technology, engineering and math (STEM) as it pertains to the manufactured world.</p> <p>Safety</p> <ul style="list-style-type: none"> • Equipment (shade 5 glasses, gloves, other safety clothing) • Fire Safety <p>Torch Setup</p> <ul style="list-style-type: none"> • Regulator • Valves • Torch Tips 	<p>Students should understand how to properly set up, ignite, and use an oxy-acetylene torch.</p>	<p>3.4.12.A1. – Important CHARACTERISTICS OF TECHNOLOGY - Compare and contrast the rate of technological development over time.</p> <p>3.4.12.C3. – Essential RESEARCH & DEVELOPMENT, INVENTION & INNOVATION, EXPERIMENTATION/PROBLEM SOLVING AND TROUBLESHOOTING - Apply the concept that many technological problems require a multi-disciplinary approach.</p> <p>3.4.12.E6. – Essential MANUFACTURING TECHNOLOGIES - Compare and contrast the importance of science, technology, engineering and math (STEM) as it pertains to the manufactured world.</p> <p>13.1.A – Essential Relate careers to individual interests, abilities, and aptitudes.</p> <p>What are the proper procedures used to set-up, ignite and operate an Oxy-Acetylene torch?</p>
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Topic: I-9-Oxy-Acetylene Torches

Days: 12

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

Torch Techniques

- Cut
- Pierce

Topic: J-10-Wildlife Management

Days: 8

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

13.1.C – Important
 Explain how both traditional and nontraditional careers offer or hinder career opportunities.

Students should understand the methods used to identify and evaluate wildlife in Pennsylvania

13.1.B – Essential
 Relate careers to personal interests, abilities and aptitudes.

13.1.D – Important
 Explain the relationship of career training programs to employment opportunities.

13.1.A – Essential
 Relate careers to individual interests, abilities, and aptitudes.

Participate in Career Development Event

Topic: K-11-Forest Management

Days: 8

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

13.1.C – Important
 Explain how both traditional and nontraditional careers offer or hinder career opportunities.

Students should understand the methods used to identify, measure and market trees/lumber.

3.4.12.E3. – Essential
 ENERGY AND POWER TECHNOLOGIES - Compare and contrast energy and power systems as they relate to pollution, renewable and non-renewable resources, and conservation.

3.4.12.E2. – Essential
 AGRICULTURAL AND RELATED BIOTECHNOLOGIES - Compare and contrast the technologies of biotechnology, conservation, bio-fuels, and ecosystems as they relate to managing Earth's resources effectively.

13.1.B – Essential
 Relate careers to personal interests, abilities and aptitudes.

- Participate in Career Development Event
- Conduct a tree measurement (DBH & Age)
- Calculate board feet in lumber
- Calculate board feet in trees
- Identify trees by using leaves, wood and bark

Topic: L-12-Agronomy Crops

Days: 8

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

13.1.C – Important
 Explain how both traditional and nontraditional careers offer or hinder career opportunities.

Students should understand the methods used to identify and analyze various agronomic plants grown in our local area.

3.4.12.E2. – Essential
 AGRICULTURAL AND RELATED BIOTECHNOLOGIES - Compare and contrast the technologies of biotechnology, conservation, bio-fuels, and ecosystems as they relate to managing Earth's resources effectively.

13.1.A – Essential
 Relate careers to individual interests, abilities, and aptitudes.

13.1.B – Essential
 Relate careers to personal interests, abilities and aptitudes.

13.1.D – Important
 Explain the relationship of career training programs to employment opportunities.

How do you identify and analyze agronomic plants grown in our local area?

Topic: M-13-Food Science

Days: 15

Subject(s): Vocations

Grade(s): 9th

Know:

Understand:

Do:

<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>13.1.C – Important Explain how both traditional and nontraditional careers offer or hinder career opportunities.</p>	<p>Students should understand the procedures used to create different foods in which humans consume.</p>	<p>3.4.12.A2. – Essential CORE CONCEPTS OF TECHNOLOGY - Describe how management is the process of planning, organizing, and controlling work.</p> <p>13.1.B – Essential Relate careers to personal interests, abilities and aptitudes.</p> <p>13.1.D – Important Explain the relationship of career training programs to employment opportunities.</p> <p>Create/make the following foods from raw materials:</p> <p>Butter</p> <p>Ice cream</p> <p>Bread</p> <p>Cheese</p> <p>Identify the key components that are used to create foods</p>
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