### Plant and Land Science

**Valid KY Course # 02 02 21**

**Course Description:** Plant and Land Science develops basic scientific knowledge and skills pertaining to management of the land and its effects on food and fiber production, the environment, and the quality of life. The relationship of land to plant growth will be emphasized. Plant composition, reproduction, growth, and current biotechnological advances will be included. Content may be enhanced with appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have a supervised agricultural experience program.

<table>
<thead>
<tr>
<th>NATIONAL AFNR STANDARDS</th>
<th>Content/Process statements followed by # codes in Bold = KOSSA Standards, *Italic = Academic Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS.01.</td>
<td>Students will:</td>
</tr>
<tr>
<td>CS.02.</td>
<td>• demonstrate employability and social skills relative to the career cluster. AA1, AA 8, AA 11, AA 14, AA 15. 1.1, 2.36, 2.38.</td>
</tr>
<tr>
<td>CS.03.</td>
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</tr>
</tbody>
</table>

| ESS.03.                  | • assess the benefit of plants and land to human kind in local, national, and world agriculture.          |
| OD 13, OD 14, OF 1.      | OD 13, OD 14, OF 1. 2.19, 2.20, 2.36                                                                |

| ESS.03.                  | • relate the physical properties of soil to plant and land use.                                       |
| OD 1, OD 2, OD 3, OD 5, OD 7. 2.2, 2.4, 2.6 |                                                                                                   |

| ESS.03.                  | • relate the chemical properties of soil to plant and land use.                                       |
| OD 4, OD 8, OD 9.        | OD 4, OD 8, OD 9. 2.2, 2.4, 2.6                                                                       |

| ESS.03.                  | • relate the biological properties of soil to plant and land use.                                     |
| OD 4, OD 9.              | OD 4, OD 9. 2.2, 2.4, 2.6                                                                            |

| ESS.03.                  | • critique the principles of good land use.                                                           |
| OA 1, OA 3, OO 1, OD 11. | OA 1, OA 3, OO 1, OD 11. 2.2, 2.15, 2.20                                                               |

| ESS.03.                  | • select appropriate plant nutrition practices and management.                                       |
| OG 1, OG 2.              | OG 1, OG 2. 4.1, 2.2, 2.4                                                                            |

| ESS.03.                  | examine the processes for plant development, growth, and reproduction.                               |
| OB 006, AC 002, AC 003.  | OB 006, AC 002, AC 003. 2.1, 2.2, 2.4, 2.6                                                              |

| ESS.03.                  | • relate biotechnology to plant production.                                                           |
| AC 006, AC007.           | AC 006, AC007. 2.1, 2.2, 2.4, 2.3                                                                      |
| ABS.03 | • maintain records on supervised agricultural experience program and be able to summarize and analyze results in making financial decisions.  
EC3, EC4, AB1, AB2, v1.11,2.13,2.18 |
|-------|--------------------------------------------------------------------------------|
| CS.01 | • utilize activities of FFA as an integral component of course content and leadership development.  
AA6, AA10, AA12, AA15, 1.12,2.16,2.37 |
| CS.11 | • apply science, math and communication skills within the technical content.  
AB 2, AA1, AB 5, 1.9, 1.10, 1.12 |

**CONNECTIONS**

- PROGRAM OF STUDIES – REVISED 2006
- KENTUCKY OCCUPATIONAL SKILL STANDARDS (KOSSA) above are from the Environmental/Natural Resources area.
- ACADEMIC EXPECTATIONS
- SECRETARY’S COMMISSION ON ACHIEVING NECESSARY SKILLS (SCANS)
- FFA CONNECTIONS: Land Judging, Agronomy CDE’s, Grain, Div. Crop, Fiber & Oil Crop, Forage, Specialty Crop Proficiencies, Crop Impromptu Speaking Contests, etc.
Introduction to Plant Science

Plant/Land Science develops basic scientific knowledge and skills pertaining to management of the land and its effects on food and fiber production, the environment, and the quality of life. The relationship of land to plant growth will be emphasized. Plant composition, reproduction, growth, and current biotechnological advances will be included. Content may be enhanced with appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have a supervised agricultural experience program.

It is recommended that a student take an introductory agricultural course, such as Principles of Agricultural Science and Technology

Technical Content

1 - Demonstrate employability and social skills relative to the career cluster
2 - Assess the benefit of plants and land to human kind in local, national, and world agriculture
9 - Relate biotechnology to plant production
10 - Maintain records on supervised agricultural experience program and be able to summarize and analyze results in making financial decisions
11 - Utilize activities of FFA as an integral component of course content and leadership development

KY Core Academic Standards (Big Idea)

Career Awareness, Exploration, Planning - Vocational Studies
Career awareness, exploration and planning gives students the opportunity to discover the various career areas that exist and introduce them to the realities involved with the workplace. Many factors need to be considered when selecting a career path and preparing for employment. Career awareness, exploration and planning will enable students to recognize the value of education, learn how to plan for careers and integrate academic subjects.

Cultures and Societies - Social Studies
Culture is the way of life shared by a group of people, including their ideas and traditions. Cultures reflect the values and beliefs of groups in different ways (e.g., art, music, literature, religion); however, there are universals (e.g., food, clothing, shelter, communication) connecting all cultures. Culture influences viewpoints, rules and institutions in a global society. Students should understand that people form cultural groups throughout the United States and the World, and that issues and challenges unite and divide them.

Employability Skills - Vocational Studies
Employability skills will focus on student's competencies with their work habits and academic/technical skills that will impact an individual's success in school and workplace. School-to-work transition skills will help students develop interpersonal skills and positive work habits.

English/Language Arts Common Core Standards

CC.9-10.L.1 Conventions of Standard English: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CC.9-10.L.2.c Conventions of Standard English: Spell correctly.
CC.9-10.L.6 Vocabulary Acquisition and Use: Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
CC.11-12.L.2 Conventions of Standard English: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Technical Literacy Standards

Craft and Structure: (Grade 9-10) 7. Translate quantitative or technical information expressed in words in a text into visual form

21st Century Skills and Knowledge

Civic Literacy
Collaboration
Communication
Creativity and Innovation
Critical Thinking and Problem Solving
Environmental Literacy
Financial, Economic, Business and Entrepreneurial Literacy
Flexibility and Adaptability
### KOSSA Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001.OA.1</td>
<td>Understand scientific plant classification</td>
</tr>
<tr>
<td>1001.OA.5</td>
<td>Analyze the process of plant growth and development</td>
</tr>
<tr>
<td>1001.OG.1</td>
<td>Clean and maintain hand tools</td>
</tr>
<tr>
<td>1001.OH.2</td>
<td>Identify immediate and real costs of an accident</td>
</tr>
<tr>
<td>1001.OH.3</td>
<td>Identify hazardous substances in the workplace</td>
</tr>
<tr>
<td>1001.OH.4</td>
<td>Comply with established safety practices</td>
</tr>
<tr>
<td>1001.OH.5</td>
<td>Identify fire exits and fire fighting equipment</td>
</tr>
<tr>
<td>1001.OH.6</td>
<td>Maintain a clean and safe work facility</td>
</tr>
</tbody>
</table>

### Learning Targets

<table>
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<th>Target</th>
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| Evaluate the uses of plants for use as food, fiber, fuel, medical, aesthetic, as well as other uses. | File "Importance of Plants"
A group learning activity where students evaluate a specific plant for its importance in food, fiber, fuel, medical, aesthetic and other uses. |
| Implement a comprehensive SAE plan with connections to a career path | Link: SAE Contract, SAE Yearly SMART Goals
www.theaet.com
Files: "IntroToSAEsGuide.pdf"
"IntroTOSAEGuideQuiz"
"Record_Book_Calendar1"
"SAE_Introduction_to_SAE_Programs"
"SAE_Contract"
Students will be introduced to SAEs and be given the opportunity to set goals and make plans for their SAE. |
| Describe the major segments of the plant science/horticulture industry | File:
Segments of the plant science horticulture |
| Research and evaluate careers related to plant and land science along with describing the skills necessary to gain employment | Files: "Careers in Agriculture Wheel Notes" and "Careers Research Project"
Students will research a career that interests them and create a presentation on that career. |
| Identify the impacts of biotechnology on plant science/horticulture | File: "Innovations in Plant Biotechnology" and "Innovations in Plant Biotechnology Gallery Walk Sheet"
Students will create a mini-poster of an innovation in Plant Biotechnology then do a gallery walk to record information from others' innovations. |
Integration of Knowledge and Ideas: (Grades 9-10) 4. Determine the meaning of symbols, key terms and other domain-specific words...
## 21st Century Skills and Knowledge
- Collaboration
- Communication
- Creativity and Innovation
- Environmental Literacy
- ICT (Information, Communications, and Technology) Literacy

## KOSSA Standards
- 1001.OA.2 Compare the anatomical parts and distinguishing characteristics of plants
- 1001.OA.3 Understand the reproductive processes of plants
- 1001.OA.4 Investigate sexual and asexual reproduction of plants including tissue culture

### Learning Targets

<table>
<thead>
<tr>
<th>Learning Target</th>
<th>Sample Learner Activities</th>
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<tbody>
<tr>
<td>Identify major plant parts and their functions</td>
<td>File: Plant Anatomy and Plant Anatomy Key</td>
</tr>
<tr>
<td>Compare the processes of photosynthesis and cellular respiration and the organelles involved in each</td>
<td>File: Virtual Lab Worksheet Plant Physiology</td>
</tr>
</tbody>
</table>
| Identify various types of plants and their reproductive structures, types/purpose of flowers, and pollination methods. | File: "Daffodil Flower Dissection Worksheet"
  This pdf guides students through the dissection of a daffodil to identify reproductive structures. |
| Identify macro- and micro-nutrients essential for plant growth                  | File: "Essential Nutrients Worksheet"
  File: Part B Plant Growth and Development
  Students determine which elements are essentials for plant growth and determine whether they are typically found in air, soil or water. |
| Identify three major life cycles of plants                                      | File: "TBA"                                                                               |
Course Title | Plant/Land Science
---|---
Description | Plant and Land Science develops basic scientific knowledge and skills pertaining to management of the land and its effects on food and fiber production, the environment, and the quality of life. The relationship of land to plant growth will be emphasized. Plant composition, reproduction, growth, and current biotechnological advances will be included. Content may be enhanced with appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have a supervised agricultural experience program.
Grade Levels | 10-11
Credit Value | 1

Prerequisites
It is recommended that a student take an introductory agricultural course, such as Principles of Agricultural Science and Technology

Unit Title | Soils and Land Uses

Technical Content
1. Relate the physical properties of soil to plant and land use
2. Relate the chemical properties of soil to plant and land use
3. Relate the biological properties of soil to plant and land use
4. Critique the principles of good land use

KY Core Academic Standards (Big Idea)

Biological Change (Biological Science) - Science
The only thing certain is that everything changes. At the high school level, students evaluate the role natural selection plays in the diversity of species. Modern ideas of evolution provide a scientific explanation for three main sets of observable facts about life on Earth: the enormous number of different life forms we see about us, the systematic similarities in anatomy and molecular chemistry we see within that diversity, and the sequence of changes in fossils found in successive layers of rock that have been formed over more than a billion years.

Interdependence (Unifying Concepts) - Science
It is not difficult for students to grasp the general notion that species depend on one another and on the environment for survival. But their awareness must be supported by knowledge of the kinds of relationships that exist among organisms, the kinds of physical conditions that organisms must cope with, the kinds of environments created by the interaction of organisms with one another and their physical surroundings, and the complexity of such systems. At the high school level, the concept of an ecosystem should bring coherence to the complex array of relationships among organisms and environments that students have encountered. Students growing understanding of systems in general will reinforce the concept of ecosystems. Stability and change in ecosystems can be considered in terms of variables such as population size, number and kinds of species, productivity and the effect of human intervention.

Motion and Forces (Physical Science) - Science
Whether observing airplanes, baseballs, planets, or people, the motion of all bodies is governed by the same basic rules. At the middle level, qualitative descriptions of the relationship between forces and motion will provide the foundation for quantitative applications of Newton’s Laws. These ideas are more fully developed at the high school level along with the use of models to support evidence of motion in abstract or invisible phenomena such as electromagnetism.

The Earth and the Universe (Earth/Space Science) - Science
The Earth system is in a constant state of change. These changes affect life on Earth in many ways. At the high school level, most of the emphasis is on why these changes occur. An understanding of systems and their interacting components will enable students to evaluate supporting theories of Earth changes. The use of models and observance of patterns to explain common phenomena is essential to building a conceptual foundation and supporting ideas with evidence at all levels. Patterns play an important role as students seek to develop a conceptual understanding of gravity in their world and in the universe. High school is the time to bring all of the ideas together to look at the universe as a whole. Students will use evidence to evaluate and analyze theories related to the origin of the universe and all components of the universe.

English/Language Arts Common Core Standards

CC.9-10.L.1 Conventions of Standard English: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CC.9-10.L.6 Vocabulary Acquisition and Use: Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression
CC.11-12.L.2 Conventions of Standard English: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Technical Literacy Standards
Craft and Structure: (Grades 9-10) 4. Determine the meaning of symbols, key terms and other domain-specific words and phrases...
Mathematics Common Core Standards

CC.9-12.N.Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.*

CC.9-12.N.CN.1 Know there is a complex number $i$ such that $i^2 = -1$, and every complex number has the form $a + bi$ with $a$ and $b$ real.

CC.9-12.A.REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

CC.9-12.A.REI.2 Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

CC.9-12.F.IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*

21st Century Skills and Knowledge

Collaboration
Communication
Environmental Literacy
ICT (Information, Communications, and Technology) Literacy

KOSSA Standards

1001.OC.1 Collect soil samples
1001.OC.2 Analyze soil samples
1001.OC.3 Interpret soil samples
1001.OC.5 Analyze site according to soil type, slope, and drainage
1001.OC.4 Adjust fertility and pH from analysis

Comparison and Contrast how sand, silt, and clay particles impact soil texture

Students learn to both feel soil to determine its texture as well as utilize a soil texture triangle.

Determine the effects of soil salinity on plant growth and development

Students will collect data on the salinity and fertility of a soil sample using a LabQuest.

Discuss the importance of microbiological organisms in the soil

In this lab, students will determine the microorganism content of a particular soil.

Identify conservation practices and their appropriate uses

Students will create a model to view the effects of erosion.
### Course Title
- **Plant/Land Science**

### Description
- Plant and Land Science develops basic scientific knowledge and skills pertaining to management of the land and its effects on food and fiber production, the environment, and the quality of life. The relationship of land to plant growth will be emphasized. Plant composition, reproduction, growth, and current biotechnological advances will be included. Content may be enhanced with appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have a supervised agricultural experience program.

### Prerequisites
- It is recommended that a student take an introductory agricultural course, such as Principles of Agricultural Science and Technology

### Technical Content
- 4 - Relate the chemical properties of soil to plant and land use
- 5 - Relate the biological properties of soil to plant and land use
- 6 - Critique the principles of good land use
- 7 - Select appropriate plant nutrition practices and management

### KY Core Academic Standards (Big Idea)

#### Consumer Decisions - Vocational Studies
Individual and families need to make consumer decisions due to the numerous products/services on the market, multiple advertising techniques, and the need to make responsible financial management decisions. Accessing and assessing consumer information, comparing and evaluating products and services, provides basis for making effective consumer decisions. Consumer decisions influence the use of resources and the impact they have on the community and environment.

#### Geography - Social Studies
Geography includes the study of the five fundamental themes of location, place, regions, movement and human/environmental interaction. Students need geographic knowledge to analyze issues and problems to better understand how humans have interacted with their environment over time, how geography has impacted settlement and population, and how geographic factors influence climate, culture, the economy and world events. A geographic perspective also enables students to better understand the past and present and to prepare for the future.

### English/Language Arts Common Core Standards
- **CC.9-10.L.1** Conventions of Standard English: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **CC.9-10.L.2.c** Conventions of Standard English: Spell correctly.
- **CC.9-10.L.6** Vocabulary Acquisition and Use: Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression
- **CC.9-10.SL.1** Comprehension and Collaboration: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.
- **CC.9-10.SL.1.c** Comprehension and Collaboration: Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions.
- **CC.9-10.SL.1.d** Comprehension and Collaboration: Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.
- **CC.11-12.L.2** Conventions of Standard English: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **CC.11-12.SL.1** Comprehension and Collaboration: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.

### Technical Literacy Standards
- **Craft and Structure:** Grades 9-10 4. Determine the meaning of key symbols, key terms...

### 21st Century Skills and Knowledge
- **Collaboration**
- **Communication**
- **Environmental Literacy**
- **ICT (Information, Communications, and Technology) Literacy**
## KOSSA Standards

- 1001.OC.1 Collect soil samples
- 1001.OC.2 Analyze soil samples
- 1001.OC.3 Interpret soil samples
- 1001.OC.5 Analyze site according to soil type, slope, and drainage
- 1001.OC.6 Demonstrate the use of different soil mixes and growing media

## Learning Targets

<table>
<thead>
<tr>
<th>Sample Learner Activities</th>
<th>Click in the box to go to Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect and analyze soil samples</td>
<td>File: &quot;GPS Mapping Soil Adjustments&quot;, &quot;Soil Analysis Activity Data Sheet- 1&quot;, &quot;Soil Samples Key-1&quot;</td>
</tr>
<tr>
<td>Students will collect soil samples at given spots using GPS coordinates. This can illustrate the use of technology and precision agriculture.</td>
<td></td>
</tr>
<tr>
<td>Calculate and apply proper soil amendments based on soil analysis</td>
<td>See Soil Salinity and Fertility Lab from Soils and Land Uses Unit.</td>
</tr>
<tr>
<td>Calculate and adjust soil pH based on soil analysis</td>
<td>File &quot;Adjusting pH Lab&quot;</td>
</tr>
<tr>
<td>Students will learn the importance of pH and how to make adjustments.</td>
<td></td>
</tr>
</tbody>
</table>
**Technical Content**

5 - Relate the biological properties of soil to plant and land use
7 - Select appropriate plant nutrition practices and management

**Pest and Disease Management**

It is recommended that a student take an introductory agricultural course, such as Principles of Agricultural Science and Technology.

**KY Core Academic Standards (Big Idea)**

**Safety (Health Education) - Practical Living**

Accidents are a major cause of injury and death to children and adolescents. Unintentional injuries involving a motor vehicle, falls, drowning, fires, firearms and poisons can occur at home, school and work. Safe behavior protects a person from danger and lessens the effects of harmful situations.

**Unity and Diversity (Biological Science) - Science**

All matter is comprised of the same basic elements, goes through the same kinds of energy transformations, and uses the same kinds of forces to move. Living organisms are no exception. At the high school level, an in-depth study of the specialization and chemical changes occurring at the cellular level builds upon the foundational ideas developed earlier to investigate deoxyribonucleic acid (DNA) and effects of alterations in DNA for an individual organism as well as for a species. Emphasis at every level should be placed upon the understanding that while every living thing is composed of similar small constituents that combine in predictable ways, it is the subtle variations within these small building blocks that account for both the likenesses and differences in form and function that create the diversity of life.

**English/Language Arts Common Core Standards**

CC.9-10.L.1 Conventions of Standard English: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CC.9-10.L.2.c Conventions of Standard English: Spell correctly.
CC.9-10.L.4.c Vocabulary Acquisition and Use: Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology.
CC.9-10.L.6 Vocabulary Acquisition and Use: Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
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**Technical Literacy Standards**

Craft and Structure: (Grades 9-10) 4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases...

**21st Century Skills and Knowledge**

Civic Literacy
Collaboration
Communication
Creativity and Innovation
Critical Thinking and Problem Solving
Environmental Literacy
Global Awareness
ICT (Information, Communications, and Technology) Literacy
## KOSSA Standards

1001.OF.1 Determine proper pesticide for given symptoms
1001.OF.2 Demonstrate safe handling and storage of pesticides
1001.OF.3 Calculate, mix, and apply pesticides
1001.OF.4 Monitor for plant damage

## Learning Targets

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<tr>
<td>Examine plant damage and identify pest involved</td>
<td>File: &quot;Identifying Plant and Damage&quot;</td>
<td>Students will identify common plant pests and the damage they cause in an internet activity.</td>
</tr>
<tr>
<td>Examine plant symptoms and identify disease involved</td>
<td>File &quot;Plant Disease Symptoms Identification&quot; Powerpoint and &quot;Plant Identification Worksheet&quot;</td>
<td>Students view a presentation on major plant diseases and record essential information on the worksheet.</td>
</tr>
<tr>
<td>Identify and eradicate common invasive plants and evaluate their economic impact</td>
<td>File &quot;Identifying and Eradicating Common Invasive Plants&quot;</td>
<td>Students will create a presentation on a common invasive plant and how to eradicate it.</td>
</tr>
<tr>
<td>Demonstrate proper safety measures used in pesticide selection and application</td>
<td>Link &quot;<a href="http://www.unce.unr.edu/programs/sites/pesticide/files/pdf/Chapter11.pdf">http://www.unce.unr.edu/programs/sites/pesticide/files/pdf/Chapter11.pdf</a>&quot;</td>
<td>Students will research essential knowledge related to pesticide application from the National Pesticide Applicator Certification Core Manual.</td>
</tr>
<tr>
<td>Determine the appropriate pesticide to use for a given situation and application procedure to use</td>
<td>File: &quot;Selecting Appropriate Pesticides and Applications&quot;</td>
<td>Students will view the manual to determine appropriate methods for applying pesticides.</td>
</tr>
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</table>
Technical Content

1 - Demonstrate employability and social skills relative to the career cluster
2 - Assess the benefit of plants and land to human kins in local, national, and world agriculture

Plant/Land Science

Plant and Land Science develops basic scientific knowledge and skills pertaining to management of the land and its effects on food and fiber production, the environment, and the quality of life. The relationship of land to plant growth will be emphasized. Plant composition, reproduction, growth, and current biotechnological advances will be included. Content may be enhanced with appropriate computer applications. Leadership development will be provided through FFA. Each student will be expected to have a supervised agricultural experience program.

It is recommended that a student take an introductory agricultural course, such as Principles of Agricultural Science and Technology

Marketing and Management

KY Core Academic Standards (Big Idea)

Communication/Technology - Vocational Studies
Special communication and technology skills are needed for success in schooling and in the workplace. Students will be able to express information and ideas using a variety of technologies in various ways.

Consumer Decisions - Vocational Studies
Individual and families need to make consumer decisions due to the numerous products/services on the market, multiple advertising techniques, and the need to make responsible financial management decisions. Accessing and assessing consumer information, comparing and evaluating products and services, provides basis for making effective consumer decisions. Consumer decisions influence the use of resources and the impact they have on the community and environment.

Economics - Social Studies
Economics includes the study of production, distribution and consumption of goods and services. Students need to understand how their economic decisions affect them, others, the nation and the world. The purpose of economic education is to enable individuals to function effectively both in their own personal lives and as citizens and participants in an increasingly connected world economy. Students need to understand the benefits and costs of economic interaction and interdependence among people, societies, and governments.

Financial Literacy - Vocational Studies
Financial literacy provides knowledge so that students are responsible for their personal economic well-being. As consumers, individuals need economic knowledge as a base for making financial decisions impacting short and long term goals throughout one’s lifetime. Financial literacy will empower students by providing them with the knowledge, skills and awareness needed to establish a foundation for a future of financial responsibility and economic independence.

Geography - Social Studies
Geography includes the study of the five fundamental themes of location, place, regions, movement and human/environmental interaction. Students need geographic knowledge to analyze issues and problems to better understand how humans have interacted with their environment over time, how geography has impacted settlement and population, and how geographic factors influence climate, culture, the economy and world events. A geographic perspective also enables students to better understand the past and present and to prepare for the future.

Government and Civics - Social Studies
The study of government and civics equips students to understand the nature of government and the unique characteristics of American representative democracy, including its fundamental principles, structure, and the role of citizens. Understanding the historical development of structures of power, authority, and governance and their evolving functions in contemporary U.S. society and other parts of the world is essential for developing civic competence. An understanding of civic ideals and practices of citizenship is critical to full participation in society and is a central purpose of the social studies.

Information, Communication and Productivity - Technology
Students demonstrate a sound understanding of the nature and operations of technology systems. Students use technology to learn, to communicate, increase productivity and become competent users of technology. Students manage and create effective oral, written and multimedia communication in a variety of forms and contexts.

Research, Inquiry/Problem-Solving and Innovation - Technology
Students understand the role of technology in research and experimentation. Students engage technology in developing solutions for solving problems in the real world. Students will use technology for original creation and innovation.

Safety and Ethical/Social Issues - Technology
Students understand safe and ethical/social issues related to technology. Students practice and engage in safe, responsible and ethical use of technology. Students develop positive attitudes toward technology use that supports lifelong learning, collaboration, personal pursuits and productivity.
English/Language Arts Common Core Standards

CC.9-10.L.1 Conventions of Standard English: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CC.9-10.L.1.b Conventions of Standard English: Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations.
CC.9-10.L.2 Conventions of Standard English: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
CC.9-10.L.2.c Conventions of Standard English: Spell correctly.
CC.9-10.L.6 Vocabulary Acquisition and Use: Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
CC.9-10.SL.2 Comprehension and Collaboration: Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.
CC.9-10.SL.4 Presentation of Knowledge and Ideas: Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
CC.9-10.W.6 Production and Distribution of Writing: Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.
CC.11-12.L.2 Conventions of Standard English: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Technical Literacy Standards
Craft and Structure (Grades 9-10) 4. Determine the meaning of symbols, key terms

Mathematics Common Core Standards
CC.9-12.F.IF.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*

21st Century Skills and Knowledge
Civic Literacy
Collaboration
Creativity and Innovation
Critical Thinking and Problem Solving
Environmental Literacy
Financial, Economic, Business and Entrepreneurial Literacy
Flexibility and Adaptability
Global Awareness
ICT (Information, Communications, and Technology) Literacy
Initiative and Self-Direction
Leadership and Responsibility
Media Literacy
Productivity and Accountability
Social and Cross-Cultural Skills
<table>
<thead>
<tr>
<th>Learning Targets</th>
<th>Sample Learner Activities</th>
<th>Click in the box to go to Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify government agencies and describe their role in plant/horticulture science</td>
<td>File: “Facebook Page: Government Agency”</td>
<td>Students will use the provided template to create a Facebook page for a Government agency involved in horticulture and plant science.</td>
</tr>
<tr>
<td>Develop a yearly production schedule for a specific crop</td>
<td>File: “Crop Scheduling”</td>
<td>Students will determine scheduling for a specific crop.</td>
</tr>
<tr>
<td>Analyze the impact of local weather patterns on plant growth</td>
<td>File: “United States Drought Monitor and Crop Production”</td>
<td>Students will complete a webquest to familiarize themselves with resources producers can use to determine weather patterns and predict their impact.</td>
</tr>
</tbody>
</table>