

# INTRODUCTION TO APPLIED SCIENCE

Applied Natural Science

**Curriculum Standard:** The student will develop an awareness of the interrelationships of California agriculture and society on the local, state, national, and the international levels and will discuss the economic impact of leading commodities. (Agriculture and Society)

Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>1. The student will relate the awareness of the interrelationship of California agriculture and society on the local, state, national, and international level.</p> <p>2. The students will examine the economic impact of leading commodities.</p>	<p>A. Can the student list five agricultural commodities exported from California and the United States and explain the economic importance of each?</p> <p>A. Can the student list five agricultural commodities imported to California and the United States and explain the economic importance of each?</p> <p>B. Can the student identify and explain the importance of five agricultural commodities produced the their county, California, and the United States?</p>	<ul style="list-style-type: none"> <li>• Using an international commodities map, the student will indicate with a set of symbols the countries which import various commodities and the quantity imported.</li> <li>• Using an international commodities map, the student will indicate with a set of symbols the countries which export various commodities and the quantity imported.</li> <li>• Using a map of county, California, and the United States, the students, as a class, will construct a 3-D map of California using food container labels to show where the commodities are produced.</li> </ul>

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<b>Performance Objective</b>	<b>Critical Attributes</b>	<b>Benchmarks/Assessment</b>
	<p>C. Can the student explain the relationship of the development of agriculture to the development of civilization and modern society in the United States? (i.e., diversification of labor, development of trade, mechanization, and land use)</p> <p>D. Given a computer and a word processing program, can the student produce a report on the comparison of agriculture in the United States compared to another country?</p>	<ul style="list-style-type: none"> <li>• The student will research a paper on the relationship of agriculture and the development of civilization and modern society in the United States.</li>   <li>• The student will use electronic research and word processing programs to produce a document on the comparison of agriculture in the United States compared to another country.</li> </ul>

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**Curriculum Standard:** The student will recognize the importance of employability.

<b>Performance Objective</b>	<b>Critical Attributes</b>	<b>Benchmarks/Assessment</b>
1. The student will relate the importance of various employability traits.  2. The student will discuss the traits of an effective leader.	A. Can the student recognize the effective traits of an employable individual?  B. Can the student present an effective speech?  A. Can the student lead a group discussion?  B. Can the student conduct or facilitate an effective business meeting?  C. Can the student work within a committee?  D. Can the student effectively problem solve?	<ul style="list-style-type: none"><li>• The student will create a completed portfolio: including but not limited to resume, sample job application, letter of introduction, sample work pieces, and self-evaluations.</li><li>• Given a topic, the student will prepare a speech.</li><li>• Given a topic, the student will discuss and conduct a business meeting according to Robert’s Rules of Order.</li><li>• The student will participate in a variety of FFA activities. (a minimum of 3)</li></ul>

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**Curriculum Standard:** The student will understand the interrelationship of modern agriculture and the environment, focusing on water and other natural resources in California. The student will explain how natural resource availability affects agriculture. (Agriculture and the Environment)

Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>1. The student will examine the interrelationship of modern agriculture and the environment, focusing on water and other natural resources in California.</p>	<p>A. Can the student describe the environmental impacts of agriculture on water, soil, and air?</p> <p>B. Can the student describe the environmental challenges of urban sprawl, decline in water quality, and concerns over chemical use for agriculture?</p>	<ul style="list-style-type: none"> <li>• The student will show how agriculture effects the environment of water, soil, and air.</li>   <li>• The student will use electronic research and word processing programs to produce a document on the environmental challenges of urban sprawl.</li> </ul>
<p>2. The student will deduce how natural resource availability affects agriculture.</p>	<p>A. Can the student explain the importance of agriculturists as stewards of our natural resources?</p>	<ul style="list-style-type: none"> <li>• The student will develop a model that explains how agriculturists are stewards of our natural resources. (Science Fair Project)</li> </ul>

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**Curriculum Standard:** The student will understand the role of soil in plant production. The students will explain the major factors affecting the ability of soil to support plant growth.. The student will understand the requirements for plant growth and development. The student will identify and explain the functions of plant systems and structures. The student will understand the role of fertilizers in plant production. (Basic plant science)

Performance Objective	Critical Attributes	Benchmarks/Assessment
1. The student will illustrate the role of soil in plant production.	A. Can the student describe the major components of soil: air , water, organic material, and minerals?	<ul style="list-style-type: none"> <li>• Using the soil chart, the student will determine soil texture and summarize results.</li> </ul>
2. The student will analyze the factors affecting the ability of soil to support plant growth.	A. Can the student explain the relationship of soil texture and structure to plant growth, water, penetration, water holding capacity, fertility, and tilt (workability)?	<ul style="list-style-type: none"> <li>• The student will do a lab on soil percolation and texture.</li> </ul>
3. The student will examine the requirements for plant growth and development.	A. Can the student explain the importance of soil pH and the salinity of plant growth?	<ul style="list-style-type: none"> <li>• The student will do a lab using a soil test kit.</li> </ul>
4. The student will examine and explain plant systems and structures.	A. Can the student identify the major requirements for plant growth: air, water, minerals, heat, light, and soil?	<ul style="list-style-type: none"> <li>• The student will do a lab controlling amounts of each of the elements needed for plant growth.</li> </ul>
5. The student will discuss the role of fertilizers in plant production.	A. Can the student explain the functions of the root, leaf, stem, fruit, and flower?	<ul style="list-style-type: none"> <li>• The student will do a lab involving dissection and identification of plant parts.</li> </ul>

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<b>Performance Objective</b>	<b>Critical Attributes</b>	<b>Benchmarks/Assessment</b>
	<p>B. Can the student compare and contrast monocotyledonous, and dicotyledonous plants?</p> <p>C. Can the student compare and contrast the structures of plant and animal cells?</p> <p>D. Can the student describe the primary and secondary nutrients needed for plant growth?</p> <p>E. Can the student explain the importance of micronutrients to plant growth?</p>	<ul style="list-style-type: none"> <li>• The student will do a lab involving dissection and germination.</li> <li>• The student will use electronic research using CD ROM comparing plant and animal cells.</li> <li>• The student will do a lab controlling essential nutrients, recording results on a spreadsheet.</li> <li>• The student will report results from above electronic spreadsheet lab.</li> </ul>

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***Curriculum Standard:*** The student will understand the importance of keeping accurate business records in agriculture. The students will maintain and complete the California Agricultural Record Book which pertains to their Supervised Occupational Experience (SOE) program and explain the consequences of inaccurate records. The student will understand the importance of computer literacy as it pertains to record keeping and will discuss the advantages and disadvantages of using computers as a record keeping tool. The student will be assigned to keep their record books on the computer using the computerized record book. (Basic Agricultural Business Management)

Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>1. The student will relate the importance of keeping accurate business records in agriculture.</p>	<p>A. Can the student explain reasons for keeping accurate records?</p>	<ul style="list-style-type: none"> <li>• Given a choice of several example Supervised Occupational Experience options, the student will individually complete the California Agriculture Record Book. The student will complete the record book based upon information provided by the instructor for their selected project.</li> </ul>
<p>2. The student will organize, maintain, and complete the California Agricultural Record Book which pertains to their Supervised Occupation Experience (SOE) program.</p>	<p>A. Can the student develop a budget and a business agreement for a project?</p> <p>B. Can the student prepare a financial statement and a net income summary?</p> <p>C. Can the student complete non-depreciable and depreciable property inventories?</p> <p>D. Can the student use the straight-line method for determining depreciation?</p>	

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Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>3. The student will explain the consequences of inaccurate records.</p> <p>4. The student will compare and contrast computer record keeping with manual record keeping.</p> <p>5. The student will discuss the advantages and disadvantages of using computers as a record keeping tool.</p>	<p>A. Can the student complete journal entries for two enterprises and carry entries forward to the next month?</p> <p>A. Can the student discuss at least three ways computers can be used in agriculture?</p> <p>A. Can the student identify major components of the computer: input, output, and processor?</p>	<ul style="list-style-type: none"> <li>• The student will participate in local and regional computer contest.</li> <li>• The student will convert hand kept record books to computerized record books using keyboarding and spreadsheets.</li> <li>• Using a resource book, the student will identify and explain the functions of word processing, data base, and spreadsheet software and determine the advantages and disadvantages of computers as a record keeping tool.</li> </ul>



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**Curriculum Standard:** The student will understand the importance of animals, their domestication, and role in modern society. The student will explain the care and uses of domesticated livestock in society. The students will explain the major functions of the digestive and reproductive systems. The student will understand the factors in influencing animal nutrition and feeding, The student will identify common feed ingredients. The student will identify general symptoms of animal health problems, and understand the causes of disease in domestic animals. The student will recognize a sick animal, describe its symptoms, and assist in the treatment of animals. (Basic Animal Science)

Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>1. The student will illustrate the importance of animals, their domestication, and role in modern society.</p> <p>2. The student will explain the care and uses of domesticated livestock in society.</p> <p>3. The student will examine the factors influencing animal nutrition and feeding.</p>	<p>A. Can the student explain the difference between domesticated and non-domesticated animals?</p> <p>A. Can the student describe the proper care of domesticated animals to insure their welfare and productivity?</p> <p>A. Can the student compare and contrast the basic parts and functions of monogastric and ruminant digestive systems?</p> <p>B. Can the student describe basic guidelines for animal feeding: feed at regular intervals, increase feeding rate slowly, and provide ample clean water?</p>	<ul style="list-style-type: none"> <li>• The student will compare and contrast one domestic animal species with one non-domestic animal species.</li> <li>• The student will investigate and develop a preventative health and feeding program for domesticated animals.</li> <li>• The student will diagram, label, and identify the functions of a monogastric and ruminant digestive system.</li> <li>• The student will outline the basic guidelines for animal nutrition and growth.</li> </ul>

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<b>Performance Objective</b>	<b>Critical Attributes</b>	<b>Benchmarks/Assessment</b>
<p>4. The student will examine common feed ingredients.</p>	<p>A. Can the student list six classes of nutrients and their functions?</p> <p>B. Can the student choose and justify the type of feeds suitable for the digestive system of ruminant, monogastric, and avian species?</p>	<ul style="list-style-type: none"> <li>• The student will explain and summarize six classes of nutrients and their functions.</li> <li>• The student will analyze nutrition tables and insure that feeds chosen will supply the animal with all necessary nutrients.</li> </ul>
<p>5. The student will examine general symptoms of animal health problems.</p>	<p>A. Can the student compare and contrast the major external body parts of a bovine, porcine, and avian livestock?</p>	<ul style="list-style-type: none"> <li>• The student will illustrate and label the external body parts of bovine, porcine, and avian livestock.</li> </ul>
<p>6. The student will classify the causes of diseases in domestic animals.</p>	<p>A. Can the student describe the appearance and behavior of a normal healthy animal?</p> <p>B. Can the student identify general symptoms of illness in animals such as: droopy ears, running nose, and lack of appetite?</p> <p>C. Can the student list the major factors affecting animal health, including: housing, sanitation, and nutrition?</p>	<ul style="list-style-type: none"> <li>• The student will describe abnormal experiences for domestic animals.</li> <li>• The student will describe the outward symptoms of common diseases.</li> <li>• The student will list the factors involved in preventative medicine.</li> </ul>

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<b>Performance Objective</b>	<b>Critical Attributes</b>	<b>Benchmarks/Assessment</b>
<p>7. The student will recognize a sick animal, describe its symptoms, and assist in the treatment of animals.</p> <p>8. The student will explain the importance of reproductive health in livestock.</p>	<p>A. Can the student describe and/or demonstrate methods of administering medication including: intramuscular injections, subcutaneous injections, and oral methods?</p> <p>A. Can the student label the basic parts and describe the functions of male and female reproductive systems?</p>	<ul style="list-style-type: none"> <li>• The student will demonstrate using a model of how to give intramuscular, subcutaneous, and oral medicines.</li> <li>• The student will diagram, label, and identify the functions of a male and female reproductive system.</li> </ul>

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**Curriculum Standard:** The student will recognize the traits of effective leaders and participate in leadership training activities associated with the FFA including: public speaking, leading group discussions, working within a committee, conducting business meetings, and problem solving. The student will understand the relationship between a Supervised Occupational Experience (SOE) project and their preparation for a career in agriculture. The student will actively engage in and manage a SOE which enables them to develop occupational skills. The student will be aware of existing and future employment opportunities in the field of agriculture. The student will explore a variety of agricultural occupations and analyze the qualifications required for employment. The student will develop an understanding of how to conduct a job search, interview for an agricultural job, and write a resume. The student will describe factors involved in job candidate assessment including: appearance, education, experience, listening, and communication skills. (Employability and leadership development)

Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>1. The student will perform the traits demonstrated by effective leaders and participate in leadership training activities.</p>	<p>A. Can the student explain the benefits of FFA membership?</p> <p>B. Can the student describe and explain leadership skills developed by participating in the FFA?</p> <p>C. Can the student demonstrate the use of five parliamentary procedure skills?</p>	<ul style="list-style-type: none"> <li>• The student will compare the benefits of FFA membership with non-membership.</li> <li>• Given a choice of several different leadership roles, the student will form teams and choose a specific officer position.</li> <li>• Simulating a parliamentary procedure contest, the student will debate current topics in California agriculture using knowledge of parliamentary law. Each student will be required to serve on a committee.</li> </ul>

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Performance Objective	Critical Attributes	Benchmarks/Assessment
<p>2. The student will explain and summarize the relationship between the SOE and their preparation for a career in agriculture.</p> <p>3. The student will engage in and manage a SOE which enables them to develop occupational skills.</p> <p>4. The student will explore a variety of existing and future employment opportunities in the field of agriculture.</p>	<p>D. Can the student demonstrate the ability to cooperate and collaborate by serving on a committee?</p> <p>E. Can the student make a forty minute oral presentation using multimedia and computers as aids?</p> <p>F. Can the student demonstrate the ability to give a six minute prepared speech or a four minute extemporaneous speech?</p> <p>A. Can the student develop an agricultural SOE plan? (student data sheet)</p> <p>A. Can the student demonstrate responsibility, commitment, and time management skills by conducting and maintaining a SOE?</p> <p>A. Can the student describe the six agriculture career clusters and give examples of entry, technical, and professional careers in each cluster?</p>	<ul style="list-style-type: none"> <li>• Given a leadership scenario, the student will identify and solve a problem.</li> <li>• Given a choice of an agricultural topic, the student will lead a class discussion using demonstrative aids.</li> <li>• Given a choice of an agricultural topic, the student will present a prepared or extemporaneous speech.</li> <li>• Using the example given in the FFA Student Handbook, the student will complete an agricultural SOE plan.</li> <li>• Given a choice of various agricultural ownership and non-ownership projects, the student will choose a specific project, design an operational plan, and maintain financial records.</li> <li>• The student will use electronic research and word processing programs to produce a document on potential careers in each of the six agricultural career clusters.</li> </ul>

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<p>5. The student will develop an understanding of how to conduct a job search, interview for a job, and write a resume.</p>	<p>B. Can the student complete an individual career/education plan? (student data sheet)</p> <p>A. Can the student develop and maintain a resume?</p> <p>B. Can the student describe the skills, abilities, and education required to gain entry into the agricultural occupation of their choice?</p>	<ul style="list-style-type: none"> <li>• The student will develop a student career plan during their first year in agriculture and review it on an annual basis.</li> <li>• The student will maintain a student portfolio that includes an up to date resume.</li> <li>• The student will maintain a student portfolio that includes information required to gain entry into the agricultural occupation of their choice.</li> </ul>
<p>6. The student will discuss factors involved in job candidate assessment.</p>	<p>A. Can the student demonstrate procedures for job interviewing: appropriate dress and hygiene, listening and communication skills, and the ability to relate experience and education to the job?</p> <p>B. Can the student locate and understand want-ads and posted job announcements?</p> <p>C. Can the student complete example job applications?</p>	<ul style="list-style-type: none"> <li>• The student will participate in local job interview contest.</li> <li>• Given a copy of the classified section of a local newspaper, the student will summarize information found in the job section.</li> <li>• The student will maintain a student portfolio that includes an example of a completed job application.</li> </ul>