Agriculture & Natural Resource Science Standards Grade 12

Agriculture Science I & II
First Two Years of Instruction

Effective School Year 2002-03

Agriculture Education
Office of, Career, Technical and Adult Ed.
Nevada Department of Education, Carson City

STATE BOARD APPROVED 12/1/01

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AGRICULTURAL AND NATURAL RESOURCES

Program Requirements

Occupations associated with agriculture production, natural resources, processing and distribution of food and fiber are important to the national interests and provide significant employment opportunities. Occupational education and training in agriculture and agri-business are essential to the continued economic health of Nevada and the nation, as it provides the needed competent and trained work force.

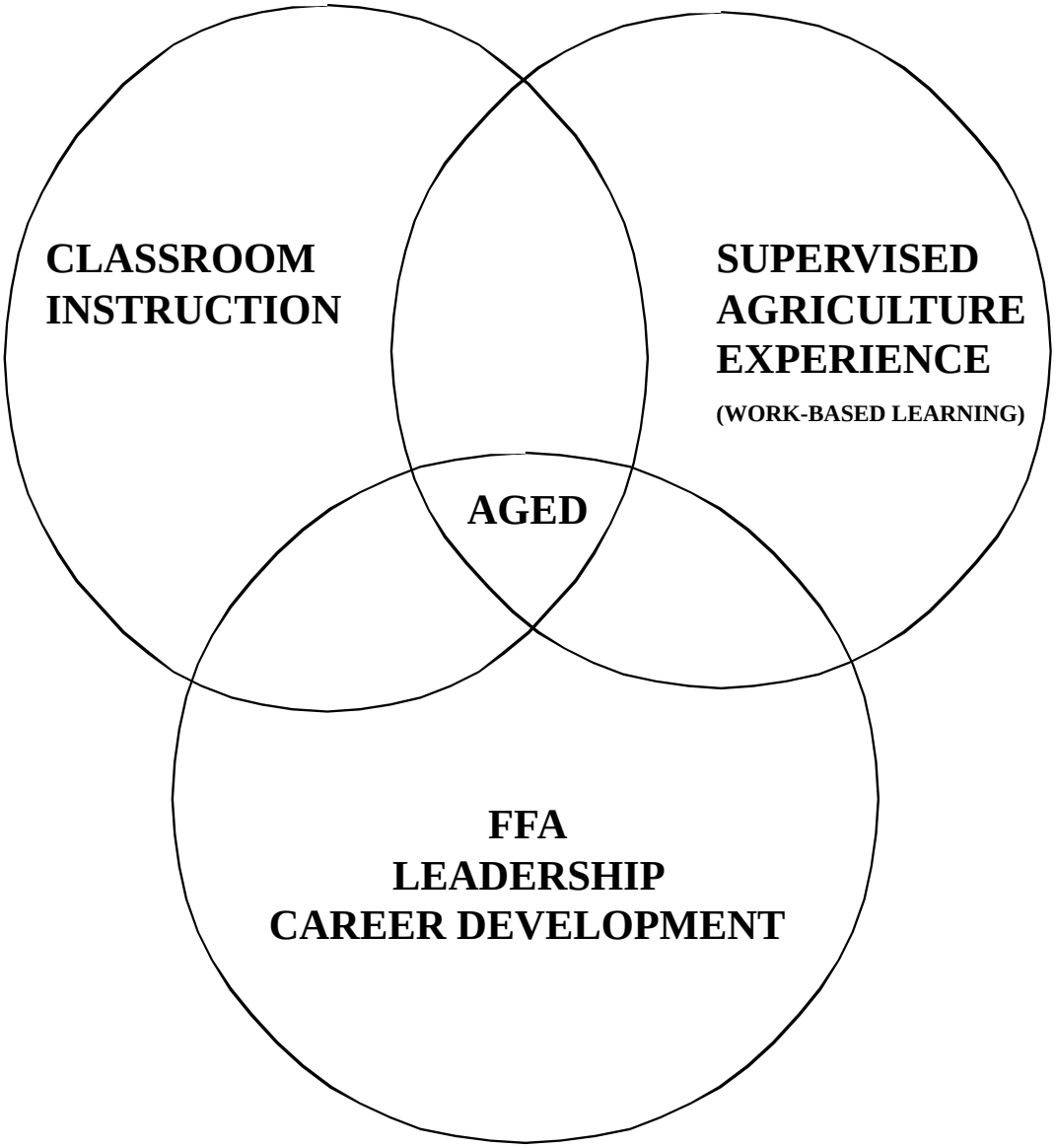
> The advent of corporate agriculture and decline of the family-operated agriculture venture mandate the maintenance, expansion and improvement of occupational agriculture education. Through agriculture education, students are prepared for employment in the field of agriculture through planning and managing agriculture, food, fiber, and natural resources systems. Production of agricultural commodities, including food fiber, wood products, horticultural crops, and other plant and animal products. Financing, processing, and marketing and distribution of agriculture products; farm production and supply and service industries; horticulture and landscaping services, and the use and conservation of land and water resources; development and maintenance of recreational resources. It also includes mining and extraction operations and related environmental management services. Source: *USOE/OVAE Brochure*

Agriculture education provides high school students with technical and specialized knowledge in production agriculture and natural resources as well as other specific agriculture occupations. The programs are designed to meet students' occupational objectives, interests, and abilities for entry into chosen occupations and can prepare them for advanced education and training. Agriculture education is a coordinated program of group and individual instructional activities consisting of classroom instruction, laboratory experiences, and leadership development. Integral to these activities are FFA (leadership development) and Supervised Agriculture Experience (work-based learning), Nevada Revised Statute 385.110. Federal/Public law#105-225which was passed in August, 1998, states "Congress of the United States, recognizes the importance of the FFA as an integral part of the program of Vocational Agriculture." All students enrolled in Agriculture Education will be recognized as members of the FFA organization. All secondary agriculture education programs and school districts will purchase a curriculum packet consisting of the New Horizons agriculture career and technical magazine, the FFA manual, and the Nevada Record Book on a yearly basis for every student enrolled in agriculture education in their program. Areas of study at the secondary level are divided into Agriculture Science and Specialized Advanced Agriculture Career and Technical Areas.

Agriculture and Society, Plant and Soil Science, Agriculture Mechanical Engineering and Technology, Animal Science, Leadership/ FFA, Agriculture Business, Sales, Marketing and Supervised Agriculture Experience, Natural Resources, and Employability are included in the Agriculture Science introduction division.

Instruction in business/specialized agriculture provides training in specific occupational skills, duties, and tasks, as determined by the business and industry needs. Specialized career and technical agriculture programs will include, but are not limited to, the following: ornamental horticulture, floriculture design, turf and landscape management, equine science and technology, forestry technology, wildlife management and enforcement, food science and processing, feedlot management, animal science, veterinary science, agriculture power systems, natural resources and reclamation, mining science and operations, nursery and greenhouse management, landscape architecture, irrigation and chemical management, lawn care and maintenance, and agriculture construction.

NEVADA
AGRICULTURE EDUCATION
Model of Instruction



Agriculture Science

Performance Level Descriptors

Content Standard 1.0: Agriculture and Society - ***Students will describe the interrelationship of Nevada agriculture and society on the local, state, national, and international levels, and will discuss the economic impact of leading commodities.***

Performance Standard 1.1	Students will be able to identify and categorize agricultural products and services in the state of Nevada.
EXCEEDS STANDARDS	• Students will identify and explain the top five agricultural commodities produced in Nevada. • Students will identify and explain five agricultural services and businesses in Nevada. • Students will identify and explain five agricultural commodities produced in their local area.
MEETS STANDARDS	• Students will recognize opportunities in high wage, high skill career opportunities in agricultural industries. • Students will list the top five agricultural commodities produced in Nevada. • Students will list five agricultural services and businesses in Nevada. • Students will list five agricultural commodities produced in their local area.
APPROACHES STANDARDS	• Students will list three top agricultural commodities produced in Nevada. • Students will list three agricultural services and businesses in Nevada. • Students will list three agricultural commodities produced in their local area.

Nevada Academic Standards Correlation:

Science Standards: 10.0, 12.0, 15.0, 16.0
Mathematics Standards: 1.0, 2.0, 5.0, 7.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 1.0: Agriculture and Society – ***Students describe the interrelationship of Nevada agriculture and society on the local, state, national, and international levels, and will discuss the economic impact of leading commodities.***

Performance Standard 1.2	Students will be able to discuss the role of agriculture in the development of society.
EXCEEDS STANDARDS	• Students will demonstrate an awareness of the importance agriculture has had on the development of the world as a society. • Students will demonstrate an awareness of the importance agriculture has had on the development of the United States as a society. • Students will demonstrate an awareness of the importance agriculture has had on the development of the state of Nevada.
MEETS STANDARDS	• Students will explain the impact of agriculture on the development of the world as a society. • Students will explain the impact of agriculture on the development of the United States as a society. • Students will explain the impact of agriculture on the development of Nevada as a state.
APPROACHES STANDARDS	• Students will demonstrate an understanding of the impact of agriculture on society.

Nevada Academic Standards Correlation:

Science Standards: 9.0, 12.0, 18.0
Mathematics Standards: 1.0, 2.0, 5.0, 7.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 1.0: Agriculture and Society - *Students will describe the interrelationship of Nevada agriculture and society on the local, state, national, and international levels, and will discuss the economic impact of leading commodities.*

Performance Standard 1.3	Students will understand the economic value of agricultural commodities produced on the local, state, national and international level.
EXCEEDS STANDARDS	• Students will compare and contrast the top five agricultural commodities and their economic value produced at the international level. • Students will compare and contrast the top five agricultural commodities and their economic value produced at the national level. • Students will compare and contrast the top five agricultural commodities and their economic value produced at the state level. • Students will compare and contrast the top five agricultural commodities and their economic value produced at the local level.
MEETS STANDARDS	• Students will describe the top five agricultural commodities and their economic value produced at the international level. • Students will describe the top five agricultural commodities and their economic value produced at the national level. • Students will describe the top five agricultural commodities and their economic value produced at the state level. • Students will describe the top five agricultural commodities and their economic value produced at the local level.
APPROACHES STANDARDS	• Students will describe three agricultural commodities and their economic value produced at the international level. • Students will describe three agricultural commodities and their economic value produced at the national level. • Students will describe three agricultural commodities and their economic value produced at the state level. • Students will describe three agricultural commodities and their economic value produced at the local level.

Nevada Academic Standards Correlation:

Science Standards: 22.0, 23.0
Mathematics Standards: 1.0, 2.0, 3.0, 5.0, 7.0, 8.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 2.0: Animal Science - ***Students will explain the importance of animals, their domestication, and role in modern society. Students will explain the care and uses of domesticated livestock in society.***

Performance Standard 2.1	Students will demonstrate an understanding of the process of evaluation and selection of livestock based on current industry standards.
EXCEEDS STANDARDS	• Students will be able to defend their evaluation using oral reasons. • Students will be able to evaluate livestock according to their genetic performance. • Students will be able to visually evaluate livestock based on United States Department of Agriculture grading standards.
MEETS STANDARDS	• Students will be able to list and describe the major breeds of beef cattle, dairy, sheep, swine, and horses. • Students will be able to list and describe the major external anatomical parts of livestock. • Students will be able to identify and describe the methods used to select the different species of livestock. • Students will be able to evaluate livestock in a systematic, organized manner according to industry standards. • Students will be able to list the USDA grading standards used in animal agriculture.
APPROACHES STANDARDS	• Students will recognize the differences between species and their uses. • Students will identify the major external anatomical parts of livestock. • Students will be able to list terms used in livestock evaluation.

Nevada Academic Standards Correlation:

Science Standards: 6.0, 7.0, 8.0, 9.0, 19.0, 22.0
Mathematics Standards: 1.0, 2.0, 3.0, 5.0, 6.0, 7.0, 8.0, 9.0
English/Language Arts: 1.0,2.0,4.0

Agriculture Science

Performance Level Descriptors

Content Standard 2.0: Animal Science - ***Students will explain the importance of animals, their domestication, and role in modern society. Students will explain the care and uses of domesticated livestock in society.***

Performance Standard 2.2	Students will *explain* the correct and safe uses and selection of animal facilities, housing, and equipment.
EXCEEDS STANDARDS	• Students will design, draft, and explain an animal housing facility. • Students will be able to demonstrate the appropriate uses of restraint and handling equipment and methods.
MEETS STANDARDS	• Students will be able to identify the various systems of housing used in livestock production. • Students will explain the safe and appropriate uses of restraint and handling equipment and methods. • Students will explain safe and appropriate use of veterinary and scientific equipment. • Students will explain the safe and appropriate behavior in an animal science laboratory. • Students will explain and apply scientific methods used in the animal science research industry.
APPROACHES STANDARDS	• Students will recognize various environmental and housing requirements. • Students will recognize the need for safe practices when handling and restraining livestock.

Nevada Academic Standards Correlation:

Science Standards: 7.0, 8.0, 19.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 5.0, 8.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 2.0: Animal Science - ***Students will explain the importance of animals, their domestication, and role in modern society. Students will explain the care and uses of domesticated livestock in society.***

Performance Standard 2.3	Students will explain the structure and function of the reproductive systems and how they relate to reproductive management practices and fetal development.
EXCEEDS STANDARDS	• Students will be able to develop a breeding program scenario. • Students will be able to outline and describe the basic principles of genetic traits and their heritibility for each species. • Students will be able to identify specific and technical equipment used with the various breeding systems. • Students will compare and contrast the structures of animal and plant cells.
MEETS STANDARDS	• Students will be able to identify the parts and functions of the reproductive systems of male and female livestock. • Students will be able to describe the different breeding systems predominantly used in livestock production. • Students will be able to describe the management techniques used in the breeding systems. • Students will be able to compare and contrast the reproductive cycles of the four major livestock species. • Students will identify the basic techniques of pre-parturition and post-parturition offspring care. • Students will diagram and identify the parts of an animal cell.
APPROACHES STANDARDS	• Students will be identify of different breeding systems used in animal agriculture. • Students will compare and contrast the basic natural breeding systems of the four major species. • Students will describe the basic advantages and disadvantages of using artificial insemination.

Nevada Academic Standards Correlation:

Science Standards: 6.0, 7.0, 8.0, 9.0, 18.0, 19.0, 20.0, 24.0
Mathematics Standards: 1.0, 3.0, 9.0
English/Language Arts: 1.0,2.0,4.0

Agriculture Science

Performance Level Descriptors

Content Standard 2.0: Animal Science - ***Students will explain the importance of animals, their domestication, and role in modern society. Students will explain the care and uses of domesticated livestock in society.***

Performance Standard 2.4	Students will explain the factors influencing animal nutrition and feeding. Students will identify common feed ingredients and will explain the uses of different feeds for particular animal species.
EXCEEDS STANDARDS	• Students will determine and calculate efficiency factors in various feeding programs. • Students will describe and explain the uses of feed additives in the development of livestock feed rations. • Students will calculate a net-energy-feeding ration.
MEETS STANDARDS	• Students will be able to identify parts and functions of the livestock digestive systems. • Students will explain the function of feed components in animal rations for various species. • Students will be able to list the steps to develop a feeding program for the different species. • Students will describe the nutritional needs of the different species.
APPROACHES STANDARDS	• Students will trace the path of the alimentary canal. • Students will explain the function of proteins, carbohydrates, vitamins, minerals, and water in livestock feeding. • Students realize there are different digestive systems in the major livestock species. • Students will be able to interpret a feed tag.

Nevada Academic Standards Correlation:

Science Standards: 3.0, 4.0, 6.0, 7.0, 19.0, 23.0
Mathematics Standards: All
English/Language Arts: 1.0,2.0,4.0

Agriculture Science

Performance Level Descriptors

Content Standard 2.0: Animal Science – ***Students will explain the importance of animals, their domestication, and role in modern society. Students will explain the care and uses of domesticated livestock in society.***

Performance Standard 2.5	Students will identify general symptoms of animal health problems and will explain the causes of disease in domestic animals.
EXCEEDS STANDARDS	• Students will be able to list common livestock diseases by cause, symptom, and treatment. • Students will demonstrate several methods of application of medications.
MEETS STANDARDS	• Students will identify unhealthy livestock by using visual and non-visual indicators of health. • Students will list the causes' of disease and the methods of entry into the host. • Students will describe the components of a complete herd health system. • Students will explain the types of immunity in livestock.
APPROACHES STANDARDS	• Students will list the factors affecting animal health. • Students will recognize biological stress factors related to animal health.

Nevada Academic Standards Correlation:

Science Standards: 4.0, 6.0, 7.0, 8.0, 18.0, 19.0, 20.0, 24.0
Mathematics Standards: 1.0, 3.0, 9.0
English/Language Arts: 1.0,2.0,4.0

Agriculture Science

Performance Level Descriptors

Content Standard 2.0: Animal Science – ***Students will explain the importance of animals, their domestication, and role in modern society. Students will explain the care and uses of domesticated livestock in society.***

Performance Standard 2.6	Students will develop an appreciation of the public's perception of animal welfare issues.
EXCEEDS STANDARDS	• Students will compare and contrast the difference between animal welfare and animal rights.
MEETS STANDARDS	• Students will recognize opportunities in high wage, high skill career opportunities in animal science. • Students will explain the difference between animal welfare and animal rights. • Students will be able to compare and contrast the role of companion animals and production livestock in society.
APPROACHES STANDARDS	• Students recognize the various public views in livestock production.

Nevada Academic Standards Correlation:

Science Standards: 6.0, 16.0, 17.0, 18.0, 19.0, 21.0, 22.0
Mathematics Standards: 2.0, 4.0, 5.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 3.0: Plant and Soil Science – ***Students will explain the requirements for plant growth and development with the interaction of soil, water, and fertilizer in plant production. Students will identify and explain the functions of plant systems, soil characteristics, and the interaction of both.***

Performance Standard 3.1	Students will explain the principles of plant classification by taxonomy and use.
EXCEEDS STANDARDS	• Students will identify plants' by using a dichotomous key. • Students will be able to identify plants species by their specific use, geographical location, and stages of growth.
MEETS STANDARDS	• Students will identify plants by their life cycle. • Students will identify and describe the five basic plant parts and their functions. • Students will identify the classes of plants by their economic and aesthetic use.
APPROACHES STANDARDS	• Students will identify the different plants used in agriculture. • Students will list the five major plant parts. • Students will list the three types of plant growth cycles.

Nevada Academic Standards Correlation:

Science Standards: 6.0, 7.0, 9.0, 10.0, 12.0, 15.0
Mathematics Standards: None
English/Language Arts:1.0,2.0,4.0

Agriculture Science

Performance Level Descriptors

Content Standard 3.0: Plant and Soil Science – ***Students will explain the requirements for plant growth and development with the interaction of soil, water, and fertilizer in plant production. Students will identify and explain the functions of plant*** **systems, soil characteristics, and the interaction of both.**

Performance Standard 3.2	Students will explain the principles of plant physiology and growth.
EXCEEDS STANDARDS	• Students will modify the factors affecting plant growth and predict plant response. • Students will compare and contrast the structures of animal and plant cells.
MEETS STANDARDS	• Students will indicate the importance of the six major components of plant growth. • Students will be able to identify the eleven essential elements of plant nutrition. • Students will diagram and identify the parts of a plant cell. • Students will explain the process of photosynthesis, respiration, and transpiration. • Students will be able to apply basic scientific equipment used in plant research and taxonomy. • Students will u explain and apply scientific methods in plant production.
APPROACHES STANDARDS	• Students will list the six major components of plant growth. • Students will list the components of photosynthesis process. • Students will be able to identify five essential elements of plant nutrition.

Nevada Academic Standards Correlation:

Science Standards: 4.0, 6.0, 7.0, 8.0, 9.0, 10.0, 13.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 9.0
English/Language Arts: 1.0, 2.0, 3.0, 5.0, 11.0

Agriculture Science

Performance Level Descriptors

Content Standard 3.0: Plant and Soil Science – ***Students will explain the requirements for plant growth and development with the interaction of soil, water, and fertilizer in plant production. Students will identify and explain the functions of plant systems, soil characteristics, and the interaction of both.***

Performance Standard 3.3	Students will recognize differences in plant reproductive systems.
EXCEEDS STANDARDS	• Students will demonstrate techniques for successful plant propagation. • Students will calculate germination percentage using a germination test.
MEETS STANDARDS	• Students will be able to describe the difference between complete and incomplete flowers. • Students will compare and contrast asexual and sexual plant reproduction. • Students will identify the techniques for successful plant propagation.
APPROACHES STANDARDS	• Students will list the requirements for seed germination and growth. • Students will identify the parts of a seed.

Nevada Academic Standards Correlation:

Science Standards: 2.0, 6.0, 7.0, 8.0, 15.0, 20.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 3.0: Plant and Soil Science – ***Students will explain the requirements for plant growth and development with the interaction of soil, water, and fertilizer in plant production. Students will identify and explain the functions of plant systems, soil characteristics, and the interaction of both.***

Performance Standard 3.4	Students will explain the relationship between soils and plant production.
EXCEEDS STANDARDS	• Students will be able to perform and interpret a soil texture test. • Students will collect a soil sample and interpret the analysis. • Students will recommend appropriate management practices for soil conservation.
MEETS STANDARDS	• Students will identify the basics in soil structure and texture. • Students will understand the nine land classifications in Nevada. • Students will identify the properties of soil that are necessary for plant growth. • Students will describe the principles used in general soil management conservation practices. • Students will describe management practices that aid in soil conservation.
APPROACHES STANDARDS	• Students will understand the differences in land use classifications. • Students will list the three components of soil texture. • Students will describe the importance of soil management in agriculture.

Nevada Academic Standards Correlation:

Science Standards: 2.0, 3.0, 4.0, 10.0, 11.0, 12.0, 13.0, 15.0, 16.0, 17.0, 20.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 3.0: Plant and Soil Science – ***Students will explain the requirements for plant growth and development with the interaction of soil, water, and fertilizer in plant production. Students will identify and explain the functions of plant systems, soil characteristics, and the interaction of both.***

Performance Standard 3.5	Students will explain the importance of plant systems, management, and care.
EXCEEDS STANDARDS	• Students will identify symptoms of plant pests. • Students will demonstrate methods of fertilizer and pesticide applications. • Students will compare and contrast four types of irrigation systems.
MEETS STANDARDS	• Students will recognize opportunities in high wage, high skill career opportunities in plant science. • Students will calculate the N-P-K value in a fertilizer container. • Students will describe methods of applying fertilizers. • Students will describe methods of applying pesticides and herbicides. • Students will identify four types of plant pests. • Students will describe procedures used in cultural techniques for plants. • Students will list four types of irrigation systems.
APPROACHES STANDARDS	• Students will identify commercial fertilizer and its role in plant growth. • Students will identify the need for chemical applications in plant production.

Nevada Academic Standards Correlation:

Science Standards: 2.0, 4.0, 6.0, 7.0, 15.0, 16.0, 17.0, 18.0, 20.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 6.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 3.0: Plant and Soil Science – ***Students will explain the requirements for plant growth and development with the interaction of soil, water, and fertilizer in plant production. Students will identify and explain the functions of plant systems, soil characteristics, and the interaction of both.***

Performance Standard 3.6	Students will explain the economic and aesthetic role of horticulture in their community and in local, state, and national industries.
EXCEEDS STANDARDS	• Students will develop a landscape plan. • Students will propagate, manage, and market a crop in a greenhouse. • Students will create a floral arrangement.
MEETS STANDARDS	• Students will explain principles of nursery and greenhouse systems. • Students will explain basic principles of landscape planning and design. • Students will explain basic principles of turf maintenance. • Students will explain basic principles and skills of the floriculture industry.
APPROACHES STANDARDS	• Students will list the principles of landscape design. • Students will list the common turf grasses grown in Nevada. • Students will list the common maintenance practices for turf maintenance.

Nevada Academic Standards Correlation:

Science Standards: 4.0, 6.0, 7.0, 15.0, 22.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0,4.0, 6.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 4.0: Supervised Agricultural Experience – ***Students will explain the relationship between a Supervised Agriculture Experience (SAE) and their preparation for a career in agriculture.***

Performance Standard 4.1	Students will actively engage in and manage an SAE, which enables them to develop work-based skills.
EXCEEDS STANDARDS	• Students will qualify for the Silver State FFA Degree. • Students will develop a career plan for accomplishing occupational objectives.
MEETS STANDARDS	• Students will identify and describe a career interest in agriculture or agriculture related occupation. • Students will actively participate in and manage their individual SAE. • Students will keep accurate records as prescribed by the Nevada State FFA policies and procedures. • Students will show progress with individual achievement and growth in their SAE.
APPROACHES STANDARDS	• Students will define SAE. • Students will plan their individual SAE. • Students will differentiate between the types of SAE.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 22.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 4.0, 5.0, 6.0, 7.0, 9.0
English/Language Arts: 1.0, 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 5.0: Leadership/FFA - ***Students will recognize the traits of effective leaders and participate in leadership training through involved membership in the FFA.***

Performance Standard 5.1	Students will explain basic principles of organizational framework, communications, group dynamics and team building, and meeting management.
EXCEEDS STANDARDS	• Students will apply for a chapter office. • Students will perform a speech for 6 to 8 minutes on an agriculture-related topic. • Students will serve or chair on a standing chapter committee. • Students shall demonstrate ten procedures of parliamentary law. • Students will participate in a Career Development Event on the State level.
MEETS STANDARDS	• Students will recognize opportunities in high wage, high skill career opportunities in leadership and communications. • Students will recite and explain the FFA Creed, Motto, Salute, and FFA Mission Statement. • Students will demonstrate knowledge of the history of the organization, the chapter constitution and bylaws, and the chapter program of activities. • Students will demonstrate knowledge of the FFA Code of Ethics, official dress, and the proper use of the FFA jacket. • Students will describe the meaning of the FFA colors. • Students will compete in a Career Development Event at the local level.
APPROACHES STANDARDS	• Students will demonstrate personal growth and development through membership in the FFA. • Students will list and describe FFA awards available to members. • Students will identify Career Development Events in which agriculture education students may participate.

Nevada Academic Standards Correlation:

Science Standards: 17.0, 19.0, 20.0, 21.0, 22.0
Mathematics Standards: None
English/Language Arts: 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 6.0: Agriculture Business, Sales, and Marketing - ***Students will explain the importance of agricultural firms and technologies with regard to the production, processing, servicing, purchasing, and marketing of agricultural products.***

Performance Standard 6.1	Students will explain the principles of basic marketing of agricultural products.
EXCEEDS STANDARDS	• Students will develop a marketing plan for an agricultural commodity or service. • Students will apply the law of supply and demand to determine the price of agricultural commodities. • Students will be aware of alternative agriculture marketing systems in the world economy.
MEETS STANDARDS	• Students will recognize opportunities in high wage, high skill career opportunities in agricultural business, sales, and marketing. • Students will explain the philosophy of the marketing concept. • Students will describe the key factors and methods of marketing agricultural products. • Students will explain the law of supply and demand in today's economy.
APPROACHES STANDARDS	• Students will list the types of agricultural markets.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 22.0, 23.0
Mathematics Standards: 1.0, 2.0, 3.0, 5.0, 6.0, 7.0, 8.0, 9.0
English/Language Arts: 1.0, 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 6.0: Agriculture Business, Sales, and Marketing - ***Students will explain the importance of agricultural firms and technologies with regard to the production, processing, servicing, purchasing, and marketing of agricultural products.***

Performance Standard 6.2	Students will explain the basic principles of agricultural sales and service.
EXCEEDS STANDARDS	• Students will develop and perform an agricultural sales presentation. • Students will be able to develop sales promotional materials. • Students will demonstrate the ability to prospect for customers.
MEETS STANDARDS	• Students will be able to list and describe five steps of the agricultural sales process. • Students will be able to define the types of customers and the purchasing process. • Students will compare and contrast the features and benefits of a product. • Students will explain the types of promotional tools used in the advertising process.
APPROACHES STANDARDS	• Students will identify the value of sales and marketing in the agricultural industry. • Students will define the types of products and services found in the agricultural industry.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 21.0, 22.0, 23.0
Mathematics Standards: 1.0, 2.0, 4.0, 5.0, 9.0
English/Language Arts: 1.0, 2.0, 4.0, 5.0, 7.0, 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 6.0: Agriculture Business, Sales, and Marketing - ***Students will explain the importance of agricultural firms and technologies with regard to the production, processing, servicing, purchasing, and marketing of agricultural products.***

Performance Standard 6.3	Students will explain the principles of business management concepts.
EXCEEDS STANDARDS	• Students will apply for the FFA Chapter Degree as a result of management of their SAE. • Students will analyze business records to make management decisions. • Students will compare the different depreciation methods allowed by the IRS.
MEETS STANDARDS	• Students will develop an agricultural budget. • Students will develop a business agreement. • Students will maintain a single-entry journal. • Students will develop and create a depreciable and non-depreciable inventory. • Students will maintain a daily business calendar. • Students will develop a net-worth statement. • Students will develop an income statement.
APPROACHES STANDARDS	• Students will list reasons for keeping records. • Students will list the parts of a record-keeping system. • Students will list the purposes of an inventory.

Nevada Academic Standards Correlation:

Science Standards: 23.0
Mathematics Standards: All
English/Language Arts: 1.0, 2.0, 4.0, 7.0

Agriculture Science

Performance Level Descriptors

Content Standard 7.0: Agriculture Mechanical Engineering and Technology – ***Students will explain concepts of mechanical systems and structures. Students will also understand emerging technologies and their interrelationship in the agriculture industry.***

Performance Standard 7.1	Students will explain the operating principles of common tools used in agriculture and will understand the basic principles of safety.
EXCEEDS STANDARDS	• Students will demonstrate the ability to safely maintain, recondition, and use general hand tools. • Students will demonstrate the ability to safely operate power tools. • Students will diagnose safety hazards in a working environment.
MEETS STANDARDS	• Students will recognize opportunities in high wage, high skilled career opportunities in agricultural power and technology industries. • Students will demonstrate the use of personal/group safety while working in an agriculture mechanical environment. • Students will select appropriate tools needed for a given procedure. • Students will be able to use various measuring systems and tools.
APPROACHES STANDARDS	• Students will identify the importance of safety in the agriculture mechanical engineering and technology laboratory. • Students will list seven areas of the agricultural power and technology field. • Students will identify various measuring systems and tools.

Nevada Academic Standards Correlation:

Science Standards: 1.0, 2.0, 3.0, 24.0
Mathematics Standards: 1.0, 3.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 7.0: Agriculture Mechanical Engineering and Technology – ***Students will explain concepts of mechanical systems and structures. Students will also understand emerging technologies and their interrelationship in the agriculture industry.***

Performance Standard 7.2	Students will explain the different types of power systems, major components, and principles of operation.
EXCEEDS STANDARDS	• Students will identify components within the various types of power systems in agriculture. • Students will be able to fabricate a project using one or more power systems.
MEETS STANDARDS	• Students will recognize the different types of power systems and their functions used in agriculture.
APPROACHES STANDARDS	• Students will recognize three power systems used in agriculture.

Nevada Academic Standards Correlation:

Science Standards: 1.0, 2.0, 3.0, 19.0, 23.0, 24.0
Mathematics Standards: All
English/Language Arts: 1.0, 2.0, 4.0

Agriculture Science

Performance Level Descriptors

Content Standard 8.0: Natural Resources - ***Students will explain the interrelationship of modern agriculture and the environment, focusing on water, land, and other natural resources in Nevada. Students will explain how natural resource availability affects agriculture.***

Performance Standard 8.1	Students will explain the importance of agriculturists as stewards of our natural resources.
EXCEEDS STANDARDS	• Students will participate in a natural resource management activity.
MEETS STANDARDS	• Students will recognize opportunities in high wage, high skill career opportunities in natural resources within the agriculture industry. • Students will describe how natural resources are used in agriculture. • Students will compare and contrast practices for conserving renewable and nonrenewable resources.
APPROACHES STANDARDS	• Students will list five reasons for conservation practices in agriculture.

Nevada Academic Standards Correlation:

Science Standards: 12.0, 13.0, 15.0, 16.0, 17.0, 18.0, 20.0, 21.0, 22.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 5.0, 9.0
English/Language Arts: 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 8.0: Natural Resources - ***Students will explain the interrelationship of modern agriculture and the environment, focusing on water, land, and other natural resources in Nevada. Students will explain how natural resource availability affects agriculture.***

Performance Standard 8.2	Students will describe the environmental impacts of agriculture on water, soil, and air.
EXCEEDS STANDARDS	• Students will design a soil erosion prevention plan. • Students will compare and contrast the public policy trends in the use of water and land in urban and rural areas.
MEETS STANDARDS	• Students will identify pollutants, contaminants, and wastes associated with air, water, and soil quality. • Students will describe the major issues related to water sources and water quality. • Students will perform water quality tests.
APPROACHES STANDARDS	• Students will list the various types of natural resources. • Students will describe how natural resources are used in agriculture.

Nevada Academic Standards Correlation:

Science Standards: 1.0, 10.0, 11.0, 17.0, 18.0, 21.0, 24.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 8.0: Natural Resources - ***Students will explain the interrelationship of modern agriculture and the environment, focusing on water, land, and other natural resources in Nevada. Students will explain how natural resource availability affects agriculture.***

Performance Standard 8.3	Students will explain the importance and value of mining in Nevada.
EXCEEDS STANDARDS	• Students will develop a reclamation plan. • Students will compare and contrast the economic value of mine commodities in Nevada.
MEETS STANDARDS	• Students will recognize the history of mining in Nevada. • Students will list the types of mining and recognize the economic importance of each type in Nevada. • Students will describe the processes used in mineral extraction and processing. • Students will recognize the importance of reclamation as it relates to mining and the natural resources of Nevada.
APPROACHES STANDARDS	• Students will identify the importance of mining in Nevada. • Students will describe the importance of reclamation and its relation to the mining industry.

Nevada Academic Standards Correlation:

Science Standards: 10.0, 11.0, 12.0, 13.0, 15.0, 16.0, 17.0 18.0, 22.0, 23.0, 24.0
Mathematics Standards: All
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 8.0: Natural Resources - ***Students will explain the interrelationship of modern agriculture and the environment, focusing on water, land, and other natural resources in Nevada. Students will explain how natural resource availability affects agriculture.***

Performance Standard 8.4	Students will explain the importance of wildlife management and its interrelationship to agriculture.
EXCEEDS STANDARDS	• Students will take random population samples of local wildlife. • Students will develop a wildlife management plan.
MEETS STANDARDS	• Students will compare habitat requirements for different wildlife species. • Students will identify factors that influence wildlife population dynamics. • Students will identify endangered and threatened species listed in Nevada. • Students will assess the economic impact of wildlife management in Nevada.
APPROACHES STANDARDS	• Students will list the classifications of wildlife species in the state of Nevada. • Students will identify the outdoor recreation impact on our natural resources.

Nevada Academic Standards Correlation:

Science Standards: 6.0, 7.0, 8.0, 9.0, 15.0,16.0, 17.0, 18.0, 21.0, 22.0, 23.0
Mathematics Standards: 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 9.0
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard – *Students shall achieve competence in workplace readiness, career development, and lifelong learning.*

Performance Standard 9.1	Students shall demonstrate problem-solving skills.
EXCEEDS STANDARDS	• Students will solve three problems using the seven steps of problem solving. • Students will incorporate problem-solving skills through a Career Development Event in FFA.
MEETS STANDARDS	• Students will list and describe the seven steps to problem solving. • Students will identify leadership styles used in problem solving. • Demonstrates brainstorming techniques. • Examines and explains the advantages and disadvantages of alternative solutions to one or more problems. • Creates an action plan based upon a solution to a work-related problem. • Identifies the benefits of solving a work-related problem
APPROACHES STANDARDS	• Students will explain the importance of problem solving.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 21.0, 22.0, 23.0
Mathematics Standards: 1.0, 6.0, 9.0
English/Language Arts: 1.0, 2.0, 4.0, 5.0, 6.0, 7.0

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard - *Students shall achieve competence in workplace readiness, career development, and lifelong learning.*

Performance Standard 9.2	Students shall demonstrate critical thinking skills.
EXCEEDS STANDARDS	• Students shall demonstrate critical thinking skills in a Career Development Event. • Students will demonstrate the skills necessary to identify, analyze, and offer solutions for agricultural issues. • Students will formulate, implement, and evaluate an action plan.
MEETS STANDARDS	• Students will demonstrate critical thinking skills through the planning and implementation of their SAE program. • Students will list and describe the skills necessary to identify, analyze, and offer solutions for agricultural issues. • Students will use critical thinking processes to support solving problems and making decisions. • Demonstrates critical thinking skills necessary in the workplace. • Explain how emotional thinking and logical thinking affect decision making in the workplace. • Explain the difference between reliable and unreliable observations and statements of facts. • Recognizes patterns or relationships through observation and discovery.
APPROACHES STANDARDS	• Students will identify the importance of critical thinking skills in identifying, analyzing, and offering solutions for agricultural issues.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 21.0, 22.0, 23.0
Mathematics Standards: 1.0, 5.0, 7.0, 8.0, 9.0
English/Language Arts: 1.0, 2.0, 4.0, 7.0

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard - ***Students shall achieve competence in workplace readiness, career development, and lifelong learning.***

Performance Standard 9.3	Students shall demonstrate the ability to speak, write, and listen effectively.
EXCEEDS STANDARDS	• Students will identify ways to adapt their communication style to that of others. • Students will describe and use techniques to improve listening, reading, writing, speaking, and nonverbal communication skills. • Students will explain assertive communication.
MEETS STANDARDS	• Students will recognize and overcome communication barriers. • Students will describe characteristics of four communication styles. • Students will discuss the importance of self-communication and interpersonal communication. • Students will memorize and recite the FFA Creed. • Students will identify, research, prepare, and present an agriculturally related speech. • Explain the benefits of effective communication skills in the workplace. • Effectively interprets and responds to verbal and nonverbal messages. • Demonstrate proper telephone etiquette. • Effectively communicates thoughts, ideas, and information in writing. • Organizes ideas and communicates orally; is able to effectively demonstrate job skills to others. • Locates, understands and interprets written information in documents such as manuals, graphs and schedules. • Selects and utilizes an appropriate medium for conveying messages with dignity and respect. • Organize information into the appropriate format in accordance with standard practices, which includes prewriting, drafting, proofreading, editing/revising, and preparing final copy. • Demonstrates sensitivity to cultural diversity in communication. • Identifies common communication barriers and methods for

	improving communication.
APPROACHES STANDARD	• Students will define communications. • Students will explain the relationship between communication and leadership. • Students will explain the purpose of communication. • Students will explain the communication process.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 21.0, 22.0, 23.0
Mathematics Standards: 1.0, 7.0, 9.0
English/Language Arts: 1.0,2.0, 3.0, 6.0, 7.0, 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard – *Students shall achieve competence in workplace readiness, career development, and lifelong learning.*

Performance Standard 9.4	Students shall demonstrate the ability to select, apply, and maintain appropriate technology.
EXCEEDS STANDARDS	• Students will be able to complete a computer-based application for an FFA awards program. • Students will complete a computer-based record book program. • Students will conduct agriculture research using print, multi-media, and internet resources and use graphs, charts, and/or diagrams to describe trends related to the topic.
MEETS STANDARDS	• Students will be able to operate a database program as it relates to agriculture. • Students will be able to operate a spreadsheet application related to agriculture. • Students will be able to operate a word processing program. • Students will construct a multimedia presentation. • Students will access and demonstrate use of the Internet by accessing and exploring the Nevada State Agriculture web site and related agriculture sites. • Demonstrate ability to utilize basic keyboarding techniques. • Demonstrate ability to utilize other input devices. • Demonstrate ability to utilize various electronic research methods. • Demonstrate knowledge of the basic technology systems currently available and how they apply to your field. • Investigate and explain the use, benefits, and costs of technological developments in the workplace and school. • Identify and demonstrate the appropriate use of technology to enhance the efficiency of the workplace and school. • Demonstrate routine maintenance and repair of technological equipment.
APPROACHES STANDARD	• Students will recognize the importance of information technology in agriculture. • Students will list and describe the types of applications used in information technology.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 21.0, 22.0, 23.0, 24.0
Mathematics Standards: 1.0, 2.0, 9.0
English/Language Arts: 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard - ***Students shall achieve competence in workplace readiness, career development, and lifelong learning.***

Performance Standard 9.5	Students shall demonstrate leadership and teamwork skills.
EXCEEDS STANDARDS	• Students will demonstrate ten procedures of parliamentary law. • Student will lead a group discussion. • Students will analyze five stages of group development.
MEETS STANDARDS	• Students will participate in a group panel discussion. • Students will participate in one of the seven FFA leadership development conferences. • Students will demonstrate five procedures of parliamentary law. • Student will participate in planning and conducting of at least three official functions in the FFA Chapter Program of Activities. • Students will explain the importance of democratic group leadership. • Students will describe the characteristics of functional, task, and informal groups. • Works cooperatively with others when given a group project. • Explain traits necessary to effectively lead and influence individuals and groups. • Demonstrates appropriate attitudes and behaviors for effective leadership. • Demonstrates respect for team members, team processes and team goals. • Participates in the implementation of a group's decision and evaluates the results. • Demonstrate the qualities of an effective leader and team member. • Describes the importance of a proper dress code.
APPROACHES STANDARDS	• Students will explain the importance of groups. • Students will explain how to organize groups. • Students will participate in FFA activities at the local level.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 21.0, 22.0
Mathematics Standards: 5.0
English/Language Arts: 8.0, 9.0, 10.0, 11.0

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard - *Students shall achieve competence in workplace readiness, career development, and lifelong learning.*

Performance Standard 9.6	Students shall demonstrate sound workplace ethics.
EXCEEDS STANDARDS	• Students will model the eleven points of FFA Code of Ethics while attending a FFA activity.
MEETS STANDARDS	• Students will identify and understand the eleven points to the FFA Code of Ethics. • Students will develop personal work ethics through participation in their SAE. • Students will discuss the importance of ethics practiced in the workplace. • Develops personal work ethics through work experience. • Describes the importance of ethics practiced in the workplace. • Demonstrates regular attendance, promptness, and the willingness to follow instructions and complete an assigned task. • Demonstrates appropriate personal and professional attitudes and behaviors. • Maintains a safe, clean, and organized work area. • Demonstrates awareness of legal responsibilities related to individual performance, safety and customer satisfaction. • Demonstrates knowledge of various types of harassment.
APPROACHES STANDARDS	• Students will list the important ethics in the workplace.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 21.0, 22.0
Mathematics Standards: None
English/Language Arts: None

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard - *Students shall achieve competence in workplace readiness, career development, and lifelong learning.*

Performance Standard 9.7	Students shall demonstrate the ability to effectively manage resources in high-performance workplaces.
EXCEEDS STANDARDS	• Students will discuss the factors that affect the development of resources in high-performance workplaces. • Students will serve as a junior or Greenhand Chapter Officer.
MEETS STANDARDS	• Students will identify the important resources needed in a workplace. • Students will develop skills in evaluating themselves and others in a workplace environment. • Students will discuss the importance of managing resources in high-performance workplaces. • Identifies and organizes the human resources needed to complete a job assignment. • Identifies and organizes the material resources and space requirements needed to complete a job assignment. • Effectively uses technology at its highest level to complete a job assignment. • Demonstrate cooperation and leadership in a team at school or in a workplace setting. • Use the basic components of effective time management. • Recognize the need for management skills in the workplace with regard to stress, anger management, and substance abuse. • Estimates costs and prepares a detailed work order. • Develops a time schedule and prioritized task list to complete a job assignment.
APPROACHES STANDARD	• Students will discuss the ingredients and resources included in managing resources in high-performance workplaces.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 21.0, 22.0, 24.0
Mathematics Standards: 1.0, 5.0
English/Language Arts: 1.0, 2.0, 4.0, 5.0, 7.0

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard - *Students shall achieve competence in workplace readiness, career development, and lifelong learning.*

Performance Standard 9.8	Students shall demonstrate career planning and development skills.
EXCEEDS STANDARDS	• Students will develop a plan to match careers with their personal characteristics. • Students will utilize the resources found in the Career Information System to describe careers in production agriculture, agri-business, and agri-science.
MEETS STANDARDS	• Students shall develop an employment resume. • Students shall complete a sample job application. • Students will undergo a mock employment interview. • Students will demonstrate career planning through the development of their SAE. • Prepares a job application, and personal resume. • Completes a personal aptitude and interest inventory. • Participates in a job interview. • Establishes short-term & long-term career goals. • Uses the Nevada Career Information System or a similar computer-based program to research careers in a chosen field. • Participates in an organized job-shadowing and community service activity. • Constructs a career portfolio.
APPROACHES STANDARDS	• Students will differentiate between work, job, occupation, and career. • Students will explain the diversity of agriculture education job placement. • Students will list sources used in finding employment.

Nevada Academic Standards Correlation:

Science Standards: 19.0, 20.0, 22.0
Mathematics Standards: 1.0, 5.0
English/Language Arts: 1.0, 2.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0

Agriculture Science

Performance Level Descriptors

Content Standard 9.0: Employability Standard - *Students shall achieve competence in workplace readiness, career development, and lifelong learning.*

Performance Standard 9.9	Students shall demonstrate job-retention and lifelong-learning skills.
EXCEEDS STANDARDS	• Students will discuss how to merit employment promotions. • Students will develop a portfolio based on participation in SAE and leadership activities. • Students will participate in a school-based enterprise.
MEETS STANDARDS	• Students will identify and develop employability skills. • Students will discuss and develop employable personal management skills. • Students will discuss and develop employable academic and technical skills. • Maintain an employment/career portfolio. • Identify strategies for balancing work and family roles. • Demonstrate understanding of the need for lifelong learning in a rapidly changing job market. • Identify strategies to maintain employment in the face of job reductions. • Develop long-term career-planning strategies. • Identify various educational options needed for job advancement. • Demonstrates interpersonal skills needed for job retention. • Identify and model sound workplace ethics, such as loyalty, punctuality and initiative.
APPROACHES STANDARDS	• Students will explain the importance of positive response to authority. • Students will explain the proper procedure for leaving employment.

Nevada Academic Standards Correlation:

Science Standards: 22.0, 24.0
Mathematics Standards 1.0
English/Language Arts: None

APPENDIX A
SCIENCE
GRADE 12

Content Standard 1.0: **Forces and Motion:** Students understand that forces such as gravitational, electrical, and magnetic influence the motion of objects.

Content Standard 2.0: **Structure and Properties of Matter:** Students understand that materials have distinct properties which depend on the amount of matter present, its chemical composition, and structures.

Content Standard 3.0: **Energy and Matter: Interactions and Forms:** Students understand that changes in temperature and pressure can alter states of matter. Energy exists in many forms, and one form can change into another.

Content Standard 4.0: **Chemical Reaction:** Students understand that chemical reactions change substances into different substances.

Content Standard 5.0: **Nuclear Energy and Electromagnetic Energy:** Students understand that nuclear energy and electromagnetic energy are produced from both natural and human-made sources in many forms.

Content Standard 6.0: **Structure and Function:** Students understand that all life forms, at all levels of organization, use specialized structures and similar processes to meet life's needs.

Content Standard 7.0: **Internal and External Influences on Organisms:** Students understand that organisms respond to internal and external influences.

Content Standard 8.0: **Heredity and Diversity:** Students understand that life forms are diverse, and that they pass some characteristics to their offspring.

Content Standard 9.0: **Evolution-The Process of Biological Change:** Students understand that life forms change over time.

Content Standard 10.0: **Earth Structures and Composition:** Students understand that the Earth is composed of interrelated systems of rocks, water, air, and life.

Content Standard 11.0: **Earth Models:** Students understand that the Earth may be represented by a variety of maps and models.

Content Standard 12.0: **Earth History:** Students understand that Earth systems (such as weather and mountain formation) may change or vary.

Content Standard 13.0: **Cycles of Matter and Energy:** Students understand that Earth systems have a variety of cycles through which energy and matter continuously flow.

Content Standard 14.0: **Earth and Space Sciences:** Students understand that the Earth is part of a planetary system within the Milky Way galaxy, which is part of the known universe.

Content Standard 15.0: **Ecosystems:** Students will demonstrate an understanding that ecosystems display patterns of organization, change, and stability as a result of the interactions and interdependencies among the life forms and the physical components of the Earth.

Content Standard 16.0: **Natural Resources:** Students demonstrate and understand that natural resources include renewable and non-renewable materials and energy. All organisms, including human, use resources to maintain and improve their existence, and the use of resources can have positive and negative consequences.

Content Standard 17.0: **Conservation:** Students understand that humans have the unique ability to change personal and societal behavior based on ethical considerations regarding other organisms, the planet as a whole, and future generations.

Content Standard 18.0: **Scientific, Historical, and Technological Perspectives:** Students understand that humans have the unique ability to change personal and societal behavior based on ethical considerations regarding other organisms, the planet as a whole, and future generations. (Nature of Science, Attributes of Scientific Research, The History of Science and Invention, Technology, The Dynamic Character of Scientific Knowledge, Scientific Ethics)

Content Standard 19.0: **Reasoning and Critical Response Skills:** Independently evaluate how the validity of the techniques used affect the credibility of the information obtained in a specific kind of scientific investigation, i.e., controlled experiment, field work, or secondary research.

Content Standard 20.0: **Systems, Models, Risk, and Predictions:** Students understand that a variety of models can be used to describe or predict things and events.

Content Standard 21.0: **Scientific Values and Attitudes:** Students understand that science is an active process of systematically examining the natural world.

Content Standard 22.0: **Communication Skills:** Students understand that a variety of communication methods can be used to share scientific information.

Content Standard 23.0: **Scientific Applications of Mathematics:** Students understand that scientific inquiry is enhanced and often communicated by using mathematics.

Content Standard 24.0: **Laboratory Skills and Safety:** Students can appropriately and safely apply the tools and techniques of scientific inquiry.

APPENDIX B
MATHEMATICS
GRADE 12

Content Standard 1.0: **Numbers, Number Sense, and Computation:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.

Content Standard 2.0: **Patterns, Functions, and Algebra Performance Standards:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of pattern, functions, and algebraic relations as modeled in practical situations.

Content Standard 3.0: **Measurement:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.

Content Standard 4.0: **Spatial Relationships and Geometry:** To solve problems, communicate, and make connections within and beyond the field of mathematics, students will identify, represent, verify, and apply spatial relationships and geometric properties.

Content Standard 5.0: **Data Analysis:** To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.

Content Standard 6.0: **Problem Solving:** Students will develop their ability to solve problems by engaging in appropriate problem solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts in order to: formulate their own problems; find solutions to problems from everyday situations; develop and apply strategies to solve a wide variety of problems; and, integrate mathematical reasoning, communication, and connections.

Content Standard 7.0: **Communication:** Students will develop their ability to communicate mathematically by solving problems in which there is a need to obtain information from the real world through reading, listening, and observing in order to: translate this information into a mathematical language and symbols; process this information mathematically; and, present results in written, oral, and visual formats.

Content Standard 8.0: **Reasoning:** Students will develop their ability to reason mathematically by solving problems in which there is a need to investigate significant mathematical ideas and construct their own learning in all content areas in order to justify their thinking; reinforce and extend their logical reasoning abilities; reflect on and clarify their own thinking; and, ask questions to extend their thinking.

Content Standard 9.0: **Connections:** Students will develop the ability to make mathematical connections by solving problems in which there is a need to view mathematics as an integrated whole, identifying relationships between content strands, and integrating mathematics with other disciplines, allowing the flexibility to approach problems in a variety of ways within and beyond the field of mathematics.

APPENDIX C
ENGLISH / LANGUAGE ARTS
GRADE 12

Content Standard 1.0: Students will know and use word analysis skills and strategies to comprehend new words encountered in texts.

Content Standard 2.0: Students use reading skills and strategies to build comprehension.

Content Standard 3.0: Students read to comprehend, interpret, and evaluate literature from a variety of authors, cultures, and times.

Content Standard 4.0: Students read to comprehend, interpret, and evaluate informational texts for specific purposes.

Content Standard 5.0: Students write a variety of texts that inform, persuade, describe, evaluate, or tell a story and are appropriate to purpose and audience.

Content Standard 6.0: Students write with a clear focus and logical development, evaluating, revising, and editing for organization, style, tone, and word choice.

Content Standard 7.0: Student write using Standard English grammar, usage, punctuation, capitalization, and spelling.

Content Standard 8.0: Students listen to and evaluate oral communications for content, style, speaker's purpose, and audience appropriateness.

Content Standard 9.0: Students speak using organization, style, tone, voice, and media aids appropriate to audience and purpose.

Content Standard 10.0: Students participate in discussions to offer information, clarify ideas, and support a position.

Content Standard 11.0: Students participate in discussions to offer information, clarify ideas, and support a position.

Content Standard 12.0: Students formulate research questions, use a variety of sources to obtain information, weigh the evidence, draw valid conclusions, and present findings.