

Kentucky Occupational Skill Standards List

1001 Horticulture

AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	001	Read and process information and follow instructions.
AA	002	Read material and describe concepts.
AA	003	Use correct terminology.
AA	004	Use correct spelling, grammar, and punctuation.
AA	005	Write with accuracy, brevity, and clarity.
AA	006	Demonstrate knowledge of conflict resolution techniques.
AA	007	Possess basic computer keyboarding skills.
AA	008	Demonstrate understanding of basic interpersonal communication (listening, written, oral, etc.)
AA	009	Implement new process steps given oral instructions.
AA	010	Demonstrate the characteristics of a team player.
AA	011	Contrast the roles of a team with the role of an individual.
AA	012	Perform techniques used as a team leader.
AA	013	Organize and deliver a persuasive oral presentation.
AA	014	Demonstrate good speaking and presentation characteristics.
AA	015	Demonstrate basic leadership skills.
AA	016	Identify the organizational need for profit.
AA	017	Demonstrate use of an industry-accepted word processing software package.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	001	Add, subtract, multiply, and divide for digit numbers with or without the use of a calculator.
AB	002	Apply basic math functions to solve problems.
AB	003	Convert between US and metric measurement systems.
AB	004	Convert fractional measurement to decimal measurement.
AB	005	Compute within measurement systems.
AB	006	Document results of measurement activities and calculations.
AB	007	Calculate with percents, rate, ratio, and proportion with the use of a calculator.
AB	008	Make reasonable estimates.
AB	009	Compute calculated measurements.
AC		APPLY BASIC SCIENCE CONCEPTS AND SKILLS
AC	001	Understand scientific plant classification.
AC	002	Compare the anatomical parts and distinguishing characteristics of plants.
AC	003	Understand the reproductive processes of plants.
AC	004	Investigate sexual and asexual reproduction of plants including tissue culture.
AC	005	Analyze the process of plant growth and development.
AC	006	Be aware of biotechnology and its uses in the horticulture production.
AC	007	Explain the use of applied genetics in horticulture.
EA		EXHIBIT WORKPLACE SKILLS
EA	001	Demonstrate consistently punctual arrival.
EA	002	Document regular attendance
EA	003	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	004	Demonstrate appropriate dress and hygiene for successful employment
EA	005	Demonstrate the ability to act in a polite and respectful way towards co-workers.

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EA	006	Demonstrate the ability to complete tasks on time and accurately.
EA	007	Demonstrate the ability to make career decisions.
EA	008	Prepare a resume and letter of application or interest.
EA	009	Complete an application for employment.
EA	010	Participate in an employment interview.
EA	011	Follow directions and procedures.
EA	012	Accept constructive criticism.
EA	013	Work with minimal supervision.
EB		UNDERSTAND WORKPLACE ISSUES
EB	001	Recognize the difference between a team environment workplace and a conventional workplace.
EB	002	Identify the characteristics of a diverse workforce.
EB	003	Identify food ethical characteristics and behaviors.
EB	004	Differentiate between good and poor business ethics.
EB	005	Match employee responsibilities to employer expectations.
EB	006	Define discrimination, harassment, and equity.
EB	007	Demonstrate non-discriminatory behavior.
EB	008	Maintain confidentiality and sensitivity of company information.
EC		PERFORM BUSINESS PLANNING AND OPERATIONS PROCEDURES
EC	001	Plan and manage work schedules.
EC	002	Maintain receipts and disbursement records.
EC	003	Maintain inventory records.
EC	004	Maintain computer records.
EC	005	Identify possible actions that may lead to customer dissatisfaction.
EC	006	Identify the ways that the level of customer satisfaction may affect company success.
EC	007	Explain the importance of a business reputation.
EC	008	Identify possible actions that may be used to correct customer dissatisfaction.
EC	009	Identify the effect of quality on profit.
EC	010	Identify the effects of continuous quality improvement.
ED		DEMONSTRATE EFFECTIVE COMMUNICATION AND TEAMWORK SKILLS
ED	001	Organize materials with a logical flow.
ED	002	Interpret and clarify directions prepared by others.
ED	003	Communicate with customers.
ED	004	Write steps of an occupational process using sentences and statements as appropriate.
ED	005	Identify appropriate communication methods.
ED	006	Identify components of group dynamics.
ED	007	Demonstrate productive relationships within the work group.
EE		DEMONSTRATE PROBLEM SOLVING TECHNIQUES
EE	001	Apply a system of problem solving.
OA		DETERMINE APPROPRIATE MARKETING AND SALES STRATEGIES
OA	001	Develop a marketing plan.
OA	002	Address customer questions about products and services.
OA	003	Demonstrate sales process.

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OB		ANALYZE AND ENHANCE SOIL AND GROWING MEDIA
OB	001	Collect soil samples.
OB	002	Analyze soil samples.
OB	003	Interpret soil samples.
OB	004	Adjust fertility and pH from analysis.
OB	005	Analyze site according to soil type, slope and drainage.
OB	006	Demonstrate the use of different soil mixes and growing media.
OC		DISTINGUISH AND SELECT PLANT PRODUCTION METHOD
OC	001	Propagate specific plant materials.
OC	002	Label propagation material.
OC	003	Watering requirements of specific plants.
OC	004	Fertility requirements of specific plants
OD		DEVELOP AND IMPLEMENT PRODUCTION AND MANAGEMENT SCHEDULES
OD	001	Determine production cost for given crop.
OD	002	Regulate environmental factors for plant growth.
OD	003	Schedule production and harvest for given crop.
OD	004	Distinguish environmental issues (surface or ground water, government regulations, water testing, EPA).
OD	005	Interpret weather patterns, data.
OE		MONITOR AND CONTROL PESTS
OE	001	Determine proper pesticide for given symptoms.
OE	002	Demonstrate safe handling and storage of pesticides.
OE	003	Calculate, mix, and apply pesticides
OE	004	Monitor for plant damage.
OF		PERFORM ROUTINE SERVICE AND MAINTENANCE OF TOOLS AND EQUIPMENT
OF	001	Clean and maintain hand tools.
OF	002	Service selected equipment according to manufacturers recommendations.
OG		PROVIDE A SAFE WORKPLACE ENVIRONMENT
OG	001	Follow theft and security procedures.
OG	002	Identify emergency, safety and health rules/procedures.
OG	003	Identify immediate and real costs of an accident.
OG	004	Identify hazardous substances in the workplace.
OG	005	Identify methods of preventing accidents in the workplace.
OG	006	Assume responsibility for the personal safety of self and others.
OG	007	Comply with established safety practices.
OG	008	Identify fire exits and fire-fighting equipment.
OG	009	Maintain a clean a safe work facility.
OG	010	Report unsafe practices to appropriate personnel.
OH		UTILIZE INDUSTRY RESOURCES
OH	001	Apply electronic technology (bar code, e-mail).
OH	002	Distinguish roles and responsibilities of government agencies.
OH	003	Keep up-to-date through industry associations and trade journals.

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OH	004	Interpret the impact of the horticultural industry on local, state, national, and international economy.
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AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	001	Read and process information and follow instructions.
AA	002	Read material and describe concepts.
AA	004	Use correct spelling, grammar, and punctuation.
AA	005	Write with accuracy, brevity, and clarity.
AA	006	Demonstrate knowledge of conflict resolution techniques.
AA	007	Possess basic computer keyboarding skills.
AA	008	Demonstrate understanding of basic interpersonal communication (listening, written, oral, etc.)
AA	009	Implement new process steps given oral instructions.
AA	010	Demonstrate the characteristics of a team player.
AA	011	Contrast the roles of a team with the role of an individual.
AA	012	Perform techniques used as a team leader.
AA	013	Demonstrate productive relationships within the work group.
AA	014	Organize and deliver a persuasive oral presentation.
AA	015	Demonstrate proper speaking and presentation characteristics.
AA	016	Demonstrate basic leadership skills.
AA	017	Identify the organizational need for profit.
AA	019	Demonstrate use of an industry-accepted word processing software package.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	001	Add, subtract, multiply, and divide four-digit numbers with/without the use of a calculator.
AB	003	Apply basic math functions to solve problems.
AB	004	Convert between US and metric measurement systems.
AB	005	Convert fractional measurement to decimal measurement.
AB	006	Compute within measurement systems.
AB	007	Document results of measurement activities and calculations.
AB	008	Calculate with percents, rate, ration, and proportion with the use of a calculator.
AB	009	Make reasonable estimates.
AB	011	Compute calculated measurements.
AC		APPLY BASIC SCIENCE CONCEPTS AND SKILLS
AC	001	Understand scientific plant and animal classification.
AC	002	Compare the anatomical parts and distinguishing characteristics of plants and animals.
AC	003	Understand the reproductive processes of plants and animals.
AC	004	Analyze the process of plant and animal growth and development.
AC	005	Be aware of biotechnology and its uses in production agriculture.
AC	006	Explain the use of applied genetics in plants and animals.
EA		EXHIBIT WORKPLACE SKILLS
EA	001	Demonstrate consistently punctual arrival.
EA	002	Document regular attendance.
EA	003	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	004	Demonstrate appropriate dress and hygiene for successful employment
EA	005	Demonstrate the ability to act in a polite and respectful way towards co-workers.
EA	006	Demonstrate the ability to complete tasks on time and accurately.
EA	007	Demonstrate the ability to make career decisions.
EA	008	Prepare a resume and letter of application or interest.
EA	009	Complete an application for employment.
EA	010	Participate in an employment interview
EA	011	Follow directions and procedures.
EA	012	Accept constructive criticism.
EA	013	Work with minimal supervision.
EB		UNDERSTAND WORKFORCE ISSUES
EB	001	Recognize the difference between a team environment workplace and a conventional workplace.

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EB	002	Identify the characteristics of a diverse workplace.
EB	003	Identify good ethical characteristics and behaviors.
EB	004	Differentiate between good and poor business ethics.
EB	005	Match employee responsibilities to employer expectations.
EB	006	Define discrimination, harassment, and equity.
EB	007	Demonstrate non-discriminatory behavior.
EB	008	Maintain confidentiality and sensitivity of company information.
EC		PERFORM BUSINESS PLANNING AND OPERATIONS PROCEDURES
EC	001	Plan and manage work schedules.
EC	002	Maintain receipts and disbursement records.
EC	003	Maintain inventory records.
EC	004	Maintain computer records.
EC	005	Identify possible actions that may lead to customer dissatisfaction.
EC	006	Identify the ways that the level of customer satisfaction may affect company success.
EC	007	Explain the importance of a business reputation.
EC	008	Identify possible actions that may be used to correct customer dissatisfaction.
EC	009	Explain the effect of quality on profit.
ED		DEMONSTRATE EFFECTIVE COMMUNICATION AND TEAMWORK SKILLS
ED	001	Organize materials with a logical flow.
ED	002	Interpret and clarify directions prepared by others.
ED	003	Communicate with customers.
ED	004	Understand team concepts.
ED	005	Write steps of an occupational process using sentences and statements as appropriate.
ED	006	Select appropriate communication methods.
ED	008	Identify components of group dynamics
EE		DEMONSTRATE PROBLEM SOLVING TECHNIQUES
EE	002	Apply a system of problem solving.
OA		APPLY PRINCIPLES OF ANIMAL SCIENCE
OA	001	Apply principles of livestock nutrition.
OA	002	Apply principles of health management.
OA	003	Utilize appropriate livestock selection techniques.
OA	004	Understand principles of reproductive physiology and utilization of appropriate technology (synchronization, artificial insemination, embryo transfer).
OB		APPLY PRINCIPLES OF PLANT SCIENCE
OB	001	Utilize appropriate variety selection techniques.
OB	002	Demonstrate ability to read and utilize seed tag information.
OB	003	Demonstrate acceptable agronomic practices (seeding rates, plant spacing, planting dates).
OB	004	Identify appropriate seed bed preparation techniques (no-till, conventional-till, rotations).
OB	005	Identify appropriate techniques for harvesting and storage of crops.
OB	006	Understand plant growth requirements.
OC		UTILIZE INDUSTRY RESOURCES
OC	001	Apply use of related electronic technology (e-mail, computer applications, GPS, precision farming, ultrasound, electronic ear tags, and computer feeding).
OC	003	Interpret the input of local, state, national, and international economy to production agriculture.
OC	004	Maintain awareness of current trends in production agriculture through industry associations, trade journals, and internet resources.
OD		IMPLEMENT FARM BUSINESS MANAGEMENT PRACTICES
OD	001	Apply effective record keeping skills including financial records.
OD	002	Demonstrate knowledge of budgeting and cash flow.
OD	003	Understand requirements for and sources of credit.
OD	004	Understand procedures related to buying, leasing, and renting land and/or equipment.

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OD	005	Understand issues related to tax records and filing taxes.
OE		DETERMINE APPROPRIATE MARKETING AND SALES STRATEGIES
OE	001	Maintain an awareness of world trade issues (GMO's, drought, trade agreements)
OE	002	Maintain an awareness of strategies relating to futures, forward cash contracts, and storage.
OE	003	Maintain an awareness of risk management practices (crop insurance).
OE	004	Explore marketing resources (marketing clubs, extension programs, brokers, consultants).
OE	005	Demonstrate knowledge of specialty agriculture markets (e.g. tobacco, aquaculture, etc.).
OE	006	Develop and interpret marketing plans.
OF		APPLY AGRICULTURAL MATHEMATICS SKILLS
OF	001	Utilize basic units of distance, dry and liquid measurements.
OF	002	Calculate break-even prices.
OF	003	Calculate proper medicine dosages.
OF	004	Formulate and evaluate rations.
OF	005	Calculate fertilizer and pesticide application rates.
OF	006	Determine material supplies.
OF	007	Calculate area and volume measurements (acreage, storage, stocking).
OF	008	Analyze rations (fertilizer).
OG		UTILIZE EFFECTIVE LABOR MANAGEMENT TECHNIQUES
OG	001	Develop and understanding of related legal, financial, and labor issues.
OG	002	Demonstrate an understanding of the issues related to utilizing immigrant labor.
OG	003	Demonstrate effective and efficient delegation of labor.
OH		MONITOR AND CONTROL HEALTH, DISEASES, AND PESTS
OH	001	Demonstrate effective pest management practices.
OH	002	Recognize common plant and animal diseases.
OH	003	Apply appropriate prevention techniques and treatments of plant and animal diseases.
OH	004	Utilize understanding of plant and animal nutrition in the management and prevention of diseases.
OH	005	Utilize understanding of varieties and breeds in the management and prevention of diseases
OH	006	Understand agriculture's relationship and responsibility to guarantee a safe food supply and a healthy environment.
OI		DISTINGUISH AND SELECT APPROPRIATE PRODUCTION TECHNIQUES
OI	001	Utilize appropriate production techniques for livestock (beef cattle, dairy cattle, swine, horses,
OI	002	Utilize appropriate production techniques for crops (corn, soybeans, tobacco, forage).
OJ		APPLY BEST MANAGEMENT SAFETY PRACTICES
OJ	001	Follow theft and security procedures.
OJ	002	Identify and follow emergency, safety and health rules/procedures.
OJ	003	Identify hazardous substances in the workplace.
OJ	004	Identify immediate and real costs of an accident.
OJ	005	Identify methods of preventing accidents in the workplace.
OJ	006	Assume responsibility for the personal safety of self and others.
OJ	007	Report unsafe practices to appropriate personnel.
OK		EVALUATE RELATED GOVERNMENT AND LEGAL ISSUES
OK	001	Demonstrate an understanding of state and federal agricultural legislation (farm bill).
OK	002	Demonstrate an understanding of agricultural law (border disputes, incorporation, liability issues, injury claims, attractive nuisance, farming in populated areas).
OK	003	Identify related government agencies, their functions and their programs affects as they relate to the farm.
OL		UTILIZE INDUSTRY-RELATED TERMINOLOGY AND IDENTIFICATION SYSTEMS
OL	001	Identify common agronomic plants, grains, feeds, and seeds.
OL	002	Identify weeds and other crop pests.
OL	003	Use appropriate agricultural terminology.
OL	004	Identify the anatomical parts of domestic livestock.
OL	005	Demonstrate knowledge of livestock breeds.

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OL	006	Demonstrate knowledge of the livestock carcass.
OL	007	Recognize livestock pests.
OM		UTILIZE AGRICULTURAL STRUCTURES AND FACILITIES
OM	001	Identify needs of livestock, crop, and equipment storage.
OM	002	Calculate and analyze cost of storage.
OM	003	Demonstrate the ability to safely operate basic agriculture equipment.
ON		UTILIZE BEST MANAGEMENT PRACTICES AS RELATES TO AGRICULTURAL ENVIRONMENTAL ISSUES
ON	001	Utilize appropriate soil conservation practices.
ON	002	Identify and apply appropriate water conservation practices.
ON	003	Analyze and enhance soil fertility.
ON	004	Assess fertilizer and pesticide applications.
ON	005	Utilize livestock to enhance soil and water quality.

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AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	001	Read and process information and follow instructions.
AA	002	Read material and describe concepts.
AA	004	Use correct spelling, grammar, and punctuation.
AA	005	Write with accuracy, brevity, and clarity.
AA	006	Demonstrate knowledge of conflict resolution techniques.
AA	007	Possess basic computer keyboarding skills.
AA	008	Demonstrate understanding of basic interpersonal communication (listening, written, oral, etc.)
AA	009	Implement new process steps given oral instructions.
AA	010	Demonstrate the characteristics of a team player.
AA	011	Contrast the roles of a team with the role of an individual.
AA	012	Perform techniques used as a team leader.
AA	013	Demonstrate productive relationships within the work group.
AA	014	Organize and deliver a persuasive oral presentation.
AA	015	Demonstrate proper speaking and presentation characteristics.
AA	016	Demonstrate basic leadership skills.
AA	017	Identify the organizational need for profit.
AA	019	Demonstrate use of an industry-accepted word processing software package.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	001	Add, subtract, multiply, and divide four-digit numbers with/without the use of a calculator.
AB	003	Apply basic math functions to solve problems.
AB	004	Convert between US and metric measurement systems.
AB	005	Convert fractional measurement to decimal measurement.
AB	006	Compute within measurement systems.
AB	007	Document results of measurement activities and calculations.
AB	008	Calculate with percents, rate, ratio, and proportions with the use of a calculator.
AB	009	Make reasonable estimates.
AB	011	Compute calculated measurements.
AC		APPLY BASIC SCIENCE CONCEPTS AND SKILLS
AC	001	Understand scientific plant and animal classification.
AC	002	Compare the anatomical parts and distinguishing characteristics of plants and animals.
AC	003	Understand the reproductive processes of plants and animals.
AC	004	Analyze the process of plant and animal growth and development.
AC	005	Be aware of biotechnology and its uses in production agriculture.
AC	006	Explain the use of applied genetics in plants and animals.
EA		EXHIBIT WORKPLACE SKILLS
EA	001	Demonstrate consistently punctual arrival.
EA	002	Document regular attendance.
EA	003	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	004	Demonstrate appropriate dress and hygiene for successful employment.
EA	005	Demonstrate the ability to act in a polite and respectful way towards co-workers.
EA	006	Demonstrate the ability to complete tasks on time and accurately.
EA	007	Demonstrate the ability to make career decisions.
EA	008	Prepare a resume and letter of application or interest.
EA	009	Complete an application for employment.
EA	010	Participate in an employment interview.
EA	011	Follow directions and procedures.
EA	012	Accept constructive criticism.
EA	013	Work with minimal supervision.
EB		UNDERSTAND WORKFORCE ISSUES
EB	001	Recognize the difference between a team environment workplace and a conventional workplace.

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EB	002	Identify the characteristics of a diverse workforce.
EB	003	Identify good ethical characteristics and behaviors.
EB	004	Differentiate between good and poor business ethics.
EB	005	Match employee responsibilities to employer expectations.
EB	006	Define discrimination, harassment and equity.
EB	007	Demonstrate non-discriminatory behavior.
EB	008	Maintain confidentiality and sensitivity of company information.
EC		PERFORM BUSINESS PLANNING AND OPERATIONS PROCEDURES
EC	001	Plan and manage work schedules.
EC	002	Maintain receipts and disbursements records.
EC	003	Maintain inventory records.
EC	004	Maintain computer records.
EC	005	Identify possible actions that may lead to customer dissatisfaction.
EC	006	Identify the ways that the level of customer satisfaction may affect company success.
EC	007	Explain the importance of a business reputation.
EC	008	Identify possible actions that may be used to correct customer dissatisfaction.
EC	009	Explain the effect of quality on profit.
ED		DEMONSTRATE EFFECTIVE COMMUNICATION AND TEAMWORK SKILLS
ED	001	Organize materials with a logical flow.
ED	002	Interpret and clarify directions prepared by others.
ED	003	Communicate with customers.
ED	004	Understand team concepts.
ED	005	Write steps of an occupational process using sentences and statements as appropriate.
ED	006	Select appropriate communication methods.
ED	008	Identify components of group dynamics.
EE		DEMONSTRATE PROBLEM SOLVING TECHNIQUES
EE	002	Apply a system of problem solving.
OA		APPLY PRINCIPLES OF ANIMAL SCIENCE
OA	001	Apply principles of livestock nutrition.
OA	002	Apply principles of health management.
OA	003	Utilize appropriate livestock selection techniques.
OA	004	Understand principles of reproductive physiology and utilization of appropriate technology (synchronization, artificial insemination, embryo transfer)
OB		APPLY PRINCIPLES OF PLANT SCIENCE
OB	001	Utilize appropriate variety selection techniques.
OB	002	Demonstrate ability to read and utilize seed tag information.
OB	003	Demonstrate acceptable agronomic practices (seeding rates, plant spacing, planting dates)
OB	004	Identify appropriate seed bed preparation techniques (no-till, conventional-till, rotations).
OB	005	Identify appropriate techniques for harvesting and storage of crops.
OB	006	Understand plant growth requirements.
OC		UTILIZE INDUSTRY RESOURCES
OC	001	Apply use of related electronic technology (email, computer applications, GPS, precision farming, ultrasound, electronic ear tags, and computer feeding).
OC	003	Interpret the input of local, state, national, and international economy to production agriculture.

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OC	004	Maintain awareness of current trends in production agriculture through industry associations, trade journals, and internet resources.
OD		IMPLEMENT FARM BUSINESS MANAGEMENT PRACTICES
OD	001	Apply effective record keeping skills including financial records.
OD	002	Demonstrate knowledge of budgeting and cash flow.
OD	003	Understand requirements for and sources of credit.
OD	004	Understand procedures related to buying, leasing, and renting land and/or equipment.
OD	005	Understand issues related to tax records and filing taxes.
OE		DETERMINE APPROPRIATE MARKETING AND SALES STRATEGIES
OE	001	Maintain an awareness of world trade issues (GMO's, drought, trade agreements)
OE	002	Maintain an awareness of strategies relating to futures, forward cash contracts, storage.
OE	003	Maintain an awareness of risk management practices (crop insurance).
OE	004	Explore marketing resources (marketing clubs, extension programs, brokers, consultants).
OE	005	Demonstrate knowledge of specialty agriculture markets (e.g. tobacco, aquaculture, etc.).
OE	006	Develop and interpret marketing plans.
OF		APPLY AGRICULTURAL MATHEMATICS SKILLS
OF	001	Utilize basic units of distance, dry and liquid measurements.
OF	002	Calculate break-even prices.
OF	003	Calculate proper medicine dosages.
OF	004	Formulate and evaluate rations.
OF	006	Determine material supplies.
OF	007	Calculate area and volume measurements (acreage, storage, stocking).
OF	008	Analyze rations (fertilizers).
OG		UTILIZE EFFECTIVE LABOR MANAGEMENT TECHNIQUES
OG	001	Develop an understanding of related legal, financial, and labor issues.
OG	002	Demonstrate an understanding of the issues related to utilizing immigrant labor.
OG	003	Demonstrate effective and efficient delegation of labor.
OH		MONITOR AND CONTROL HEALTH, DISEASES, AND PESTS
OH	001	Demonstrate effective pest management practices.
OH	002	Recognize common plant and animal diseases.
OH	003	Apply appropriate prevention techniques and treatments of plant and animal diseases.
OH	004	Utilize understanding of plant and animal nutrition in the management and prevention of diseases.
OH	005	Utilize understanding of varieties and breeds in the management and prevention of diseases.
OH	006	Understand agriculture's relationship and responsibility to guarantee a safe food supply and a healthy environment.
OI		DISTINGUISH AND SELECT APPROPRIATE PRODUCTION TECHNIQUES
OI	001	Utilize appropriate production techniques for livestock (beef cattle, dairy cattle, swine, horses, sheep, poultry, specialty animals)
OI	002	Utilize appropriate production techniques for crops (corn, soybeans, tobacco, forage).
OJ		APPLY BEST MANAGEMENT SAFETY PRACTICES
OJ	001	Follow theft and security procedures.
OJ	002	Identify and follow emergency, safety and health rules/procedures.
OJ	003	Identify hazardous substances in the workplace.
OJ	004	Identify immediate and real costs of an accident,
OJ	005	Identify methods of preventing accidents in the workplace.

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OJ	006	Assume responsibility for the personal safety of self and others.
OJ	007	Report unsafe practices to the appropriate personnel.
OK		EVALUATE RELATED GOVERNMENT AND LEGAL ISSUES
OK	001	Demonstrate an understanding of state and federal agricultural legislation (farm bill).
OK	002	Demonstrate an understanding of agricultural law (border disputes, incorporation, liability issues, injury claims, attractive nuisance, farming in populated areas).
OK	003	Identify related government agencies, their functions, and their programs affects as they relate to the farm.
OL		UTILIZE INDUSTRY-RELATED TERMINOLOGY AND IDENTIFICATION SYSTEMS
OL	001	Identify common agronomic plants, grains, feeds, and seeds.
OL	002	Identify weeds and other crop pests.
OL	003	Use appropriate agricultural terminology.
OL	004	Identify the anatomical parts of domestic livestock.
OL	005	Demonstrate knowledge of livestock breeds.
OL	006	Demonstrate knowledge of the livestock carcass.
OL	007	Recognize livestock pests.
OM		UTILIZE AGRICULTURAL STRUCTURES AND FACILITIES
OM	001	Identify needs of livestock, crop, and equipment storage.
OM	002	Calculate and analyze cost of storage.
OM	003	Demonstrate the ability to safely operate basic agriculture equipment.
ON		UTILIZE BEST MANAGEMENT PRACTICES AS RELATES TO AGRICULTURAL ENVIRONMENTAL ISSUES
ON	001	Utilize appropriate soil conservation practices.
ON	002	Identify and apply appropriate water conservation practices.
ON	003	Analyze and enhance soil fertility.
ON	004	Assess fertilizer and pesticide applications.
ON	005	Utilize livestock to enhance soil and water quality.

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1004 Agribusiness

AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	001	Determine the appropriate mode of communication (e.g., print, electronic, face-to-face) for various workplace communications.
AA	002	Demonstrate appropriate etiquette when using e-communications (e.g., cell phone, e-mail, blackberries).
AA	003	Read and process information and follow instructions.
AA	004	Read material and describe concepts.
AA	005	Possess basic computer skills.
AA	006	Develop effective communication skills that include listening, active listening and nonverbal skills.
AA	007	Implement new process steps given oral instructions.
AA	008	Organize and deliver a persuasive oral presentation.
AA	009	Demonstrate proper speaking and presentation characteristics.
AA	010	Demonstrate basic leadership skills.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	001	Apply basic math functions to solve problems.
AB	002	Convert fractional measurement to decimal measurement.
AB	003	Compute within measurement systems (e.g., linear, volume, area, weight).
AB	004	Calculate with percents, rate, ratio, and proportion.
AB	005	Make reasonable estimates.
AB	006	Interpret and construct graphs from statistical data.
AC		DEMONSTRATE TECHNICAL LITERACY
AC	001	Write with accuracy, brevity, and clarity using appropriate terminology.
AC	002	Use correct spelling, grammar, and punctuation.
AC	003	Apply verbal skills to obtain and convey information. (e.g., ask relevant questions, interpret others' nonverbal cues, give verbal directions and defend ideas objectively)
AC	004	Record information to maintain and present business activity. (e.g., utilize note making strategies, organize information, select and use appropriate graphic aids)
AC	005	Prepare internal and external technical writing to convey and obtain information effectively (write professional e-mails, write executive summaries, prepare complex written reports, business plan).
AC	006	Utilize technical reading resources (e.g., Agricultural Research, Extension Publications, Progressive Farmer, Farmers Pride, and various types of business strategy books).
AC	007	Read to acquire meaning from written material and to apply the information to a task (e.g., extract relevant information from written materials).
EA		EXHIBIT WORKPLACE SKILLS
EA	001	Demonstrate personal work ethic, attendance, promptness, and willingness to follow instructions.
EA	002	Recognize the importance of time management.
EA	003	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	004	Demonstrate appropriate dress and hygiene for successful employment.
EA	005	Demonstrate the ability to act in a polite and respectful way toward co-workers.
EA	006	Demonstrate the ability to complete tasks with minimal supervision.
EA	007	Demonstrate the ability to make career decisions.
EA	008	Prepare a resume and letter of application or interest.
EA	009	Complete an application for employment.
EA	010	Participate in an employment interview.
EA	011	Follow internal policies and procedures.
EA	012	Develop skills to give and receive constructive criticism.
EB		UNDERSTAND WORKFORCE ISSUES
EB	001	Identify the characteristics of a diverse workplace.
EB	002	Identify good ethical characteristics and behaviors.
EB	003	Differentiate between good and poor business ethics.
EB	004	Describe techniques for demonstrating personal accountability and work productivity.

Kentucky Occupational Skill Standards List

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EB	005	Define discrimination, harassment, and equity.
EB	006	Demonstrate non-discriminatory behavior.
EB	007	Maintain confidentiality and sensitivity of company information.
EC		DEMONSTRATE EFFECTIVE AND ETHICAL WORKPLACE RELATIONSHIPS
EC	001	Demonstrate the characteristics of a team player.
EC	002	Perform techniques used as a team leader.
EC	003	Identify components of group dynamics.
EC	004	Contrast the roles of a team with the roles of an individual.
EC	005	Demonstrate productive relationships within the work group.
EC	006	Demonstrate knowledge of conflict resolution techniques.
EC	007	Demonstrate appropriate employee interactions in workplace situations.
EC	008	Explain the importance of maintaining professionalism in work relationships.
EC	009	Assume shared responsibility for collaborative work.
EC	010	Demonstrate honesty and integrity.
ED		DEMONSTRATE CRITICAL THINKING AND PROBLEM SOLVING SKILLS
ED	001	Analyze information in order to solve problems and questions.
ED	002	Utilize critical thinking skills to determine best options/outcomes.
ED	003	Explain the need for innovation/creative skills.
EE		RECOGNIZE WORKPLACE DEVERITY
EE	001	Explain the importance of respect for feelings and beliefs of others.
EE	002	Identify strategies to bridge cultural differences and using differing perspectives to increase quality of work.
EE	003	Illustrate techniques for eliminating gender bias and stereotyping.
EE	004	Identify ways that tasks in the workplace environment can be structured to accommodate the diverse needs of workers.
EF		DEVELOP LIFE-LONG LEARNING SKILLS
EF	001	Demonstrate initiative to advance skill levels toward professional level.
EF	002	Define, prioritize and complete tasks without direct supervision.
EF	003	Demonstrate commitment to learning as a life-long process.
EF	004	Discuss how health, motivation, and physical fitness enhance performance.
EF	005	Discuss the importance of flexible career planning and career self-management.
EF	006	Describe the impact of the global economy on jobs and careers.
EF	007	Employ leadership skills to achieve workplace objectives (personal vision, adaptability, change, shared vision).
EF	008	Identify career opportunities resulting from new and emerging technologies.
EF	009	Understand the importance of job performance evaluation as it relates to career advancement.
OA		RECOGNIZE AND UTILIZE BUSINESS MANAGEMENT PRINCIPLES
OA	001	Demonstrate basic record keeping methods.
OA	002	Compare sources and terms of credit.
OA	003	Choose appropriate financing for the agribusiness.
OA	004	Employ the use of budgets for decision making.
OA	005	Examine the impact of cash flow on the agribusiness.
OA	006	Schedule payments for appropriate taxes for the agribusiness.
OA	007	Utilize an accepted method of accounting.
OA	008	Use correct agribusiness terminology.
OA	009	Evaluate compliance with governmental and industry regulations.
OA	010	Assess allocation, procurement and inventory of resources.
OB		APPLY ECONOMIC PRINCIPLES
OB	001	Interpret the laws of supply and demand.
OB	002	Illustrate macroeconomic concepts.
OB	003	Illustrate microeconomic concepts.

Kentucky Occupational Skill Standards List

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OB	004	Describe the components of the American Private Enterprise System.
OB	005	Differentiate between basic business structures (Corporations, Co-Op, Partnerships, Entrepreneurship, and Sole Proprietorship).
OB	006	Explain concepts associated with international trade.
OC		UNDERSTAND LABOR MANAGEMENT AND HUMAN RESOURCES
OC	001	Analyze employee benefits and how they can be used as motivational tools.
OC	002	Describe methods of screening and testing potential employees.
OC	003	Explain how employee performance is evaluated.
OC	004	Demonstrate sensitivity to cultural diversity in the workplace.
OC	005	Understand the importance of following labor regulations.
OC	006	Demonstrate interpersonal skills needed for job retention.
OC	007	Plan and manage work schedules.
OC	008	Determine reasons jobs are terminated.
OD		DEMONSTRATE SALES AND MARKETING STRATEGIES
OD	001	Understand the sales process.
OD	002	Compare factors that influence buyer motivation.
OD	003	Understand the importance of customer satisfaction to the success of a business.
OD	004	Evaluate methods to determine a customer's wants and needs.
OD	005	Describe the characteristics of a successful salesperson.
OD	006	Analyze a marketing plan for an agricultural product.
OD	007	Explain the process to conduct market analysis.
OD	008	Assess current market conditions.
OD	009	Analyze an advertisement for an agricultural product, service or agribusiness.
OD	010	Develop an advertisement for an agricultural product, service or agribusiness.
OD	011	Determine the impact of transportation on the agribusiness.
OE		UNDERSTAND AND ANALYZE AGRICULTURAL POLICY
OE	001	Analyze the history of agricultural policy and predict near and long term policy goals.
OE	002	Determine how animal rights groups influence U.S. agricultural policy.
OE	003	Determine how agricultural policy and environmental policy compliment and contrast.
OE	004	Determine how proactive farm groups influence agricultural policy.
OE	005	Analyze the effect of foreign policy on agricultural economics.
OE	006	Analyze the effect of technology on agricultural policy.
OE	007	Identify how agricultural labor helps determine immigration policy.
OE	008	Identify how farmers can protect agricultural land using existing local, state, and federal laws and regulations.
OE	009	Understand how state government forms and implements state farm policy.
OE	010	Understand how the federal government forms and implements federal farm policy.
OF		ILLUSTRATE THE IMPORTANCE OF ENTREPRENEURSHIP
OF	001	Create a business plan for an agricultural product, service or agribusiness.
OF	002	Present a business proposal for an agricultural product, service or agribusiness.
OF	003	Formulate individual and business goals and objectives.
OF	004	Conduct a self-analysis to determine strengths and weaknesses.
OF	005	Evaluate the purposes of taxes.
OF	006	Distinguish between taxable and non-taxable items.
OF	007	Analyze the various types of tax credits.
OF	008	Understand local, state, and national regulations and their implications.
OF	009	Develop a marketing plan for an agricultural product, service or agribusiness.
OF	010	Determine the impact of quality on profit.
OG		UNDERSTAND RISK MANAGEMENT
OG	001	Determine how enterprise diversification can curtail production risks.
OG	002	Identify insurance strategies to minimize risk.

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OG	003	Analyze marketing techniques that reduce risk (e.g., contracts, futures, options).
OG	004	Determine how personal strengths in marketing can alleviate some risk.
OG	005	Assess and manage risks to reduce liability. (e.g., financial, environmental, workplace)
OG	006	Conclude how recruitment and training of employees can be used to manage risk.
OG	007	Determine how business structure can affect the risk in the agricultural business.
OG	008	Analyze how the uses of state and federal programs can reduce risk.
OG	009	Develop a risk management plan.
OH		UTILIZE CURRENT INDUSTRY TECHNOLOGIES
OH	001	Distinguish efficient use of technologies.
OH	002	Apply appropriate software applications (e.g., spreadsheets, word processing, databases).
OH	003	Integrate web applications and internet sales applications in agribusiness.
OH	004	Demonstrate ethical use of technologies.
OH	005	Anticipate future technologies in agribusiness.
OI		PROVIDE A SAFE WORKPLACE ENVIRONMENT
OI	001	Follow theft and security procedures.
OI	002	Evaluate emergency, safety and health rules/procedures.
OI	003	Calculate immediate and real costs of an accident.
OI	004	Recognize hazardous substances in the workplace.
OI	005	Determine methods of preventing accidents in the workplace.
OI	006	Assume responsibility for the personal safety of self and others.
OI	007	Comply with established safety practices.
OI	008	Locate fire exits and fire-fighting equipment.
OI	009	Maintain a clean and safe work facility.
OI	010	Report unsafe practices to appropriate personnel.
OI	011	Identify local, state, and federal housing regulations for employees.

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1005 Ag Power, Structural, Tech Systems

AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	1	Read and process information and follow instructions.
AA	2	Read material and describe concepts.
AA	3	Use correct terminology.
AA	4	Use correct spelling, grammar, and punctuation.
AA	5	Write with accuracy, brevity, and clarity.
AA	6	Demonstrate knowledge of conflict resolution techniques.
AA	7	Possess basic computer skills.
AA	8	Demonstrate understanding of basic interpersonal communication (listening, written, oral, etc.)
AA	9	Implement new process steps given oral instructions.
AA	10	Demonstrate the characteristics of a team player.
AA	11	Contrast the roles of a team with the role of an individual.
AA	12	Perform techniques used as a team leader.
AA	13	Organize and deliver a persuasive oral presentation.
AA	14	Demonstrate good speaking and presentation characteristics.
AA	15	Demonstrate basic leadership skills.
AA	16	Identify the organizational need for profit.
AA	17	Demonstrate use of an industry-accepted word processing software package.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	1	Add, subtract, multiply, and divide for digit numbers with or without the use of a calculator.
AB	2	Apply basic math functions to solve problems.
AB	3	Convert between US and metric measurement systems.
AB	4	Convert fractional measurement to decimal measurement.
AB	5	Compute within measurement systems.
AB	6	Document results of measurement activities and calculations.
AB	7	Calculate with percents, rate, ratio, and proportion with the use of a calculator.
AB	8	Make reasonable estimates.
AB	9	Compute calculated measurements.
EA		EXHIBIT WORKPLACE SKILLS
EA	1	Demonstrate consistently punctual arrival.
EA	2	Document regular attendance
EA	3	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	4	Demonstrate appropriate dress and hygiene for successful employment
EA	5	Demonstrate the ability to act in a polite and respectful way towards co-workers.
EA	6	Demonstrate the ability to complete tasks on time and accurately.
EA	7	Demonstrate the ability to make career decisions.
EA	8	Prepare a resume and letter of application or interest.
EA	9	Complete an application for employment.
EA	10	Participate in an employment interview.
EA	11	Follow directions and procedures.
EA	12	Accept constructive criticism.
EA	13	Work with minimal supervision.
EB		UNDERSTAND WORKPLACE ISSUES
EB	1	Recognize the difference between a team environment workplace and a conventional workplace.
EB	2	Identify the characteristics of a diverse workforce.
EB	3	Identify food ethical characteristics and behaviors.
EB	4	Differentiate between good and poor business ethics.
EB	5	Match employee responsibilities to employer expectations.
EB	6	Define discrimination, harassment, and equity.

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EB	7	Demonstrate non-discriminatory behavior.
EB	8	Maintain confidentiality and sensitivity of company information.
EC		PERFORM BUSINESS PLANNING AND OPERATIONS PROCEDURES
EC	1	Plan and manage work schedules.
EC	2	Maintain receipts and disbursement records.
EC	3	Maintain inventory records.
EC	4	Maintain computer records.
EC	5	Identify possible actions that may lead to customer dissatisfaction.
EC	6	Identify the ways that the level of customer satisfaction may affect company success.
EC	7	Explain the importance of a business reputation.
EC	8	Identify possible actions that may be used to correct customer dissatisfaction.
EC	9	Identify the effect of quality on profit.
EC	10	Identify the effects of continuous quality improvement.
ED		DEMONSTRATE EFFECTIVE COMMUNICATION AND TEAMWORK SKILLS
ED	1	Organize materials with a logical flow.
ED	2	Interpret and clarify directions prepared by others.
ED	3	Communicate with customers.
ED	4	Write steps of an occupational process using sentences and statements as appropriate.
ED	5	Identify appropriate communication methods.
ED	6	Identify components of group dynamics.
ED	7	Demonstrate productive relationships within the work group.
EE		DEMONSTRATE PROBLEM SOLVING TECHNIQUES
EE	1	Apply a system of problem solving.
OA		PST.01.01. : Select energy sources in power generation appropriate to the situation.
OA	1	PST.01.01.01.a. Identify renewable and nonrenewable energy sources and pathways of delivery.
OA	2	PST.01.01.01.b. Examine environmental impacts and efficiencies of energy sources.
OA	3	PST.01.01.01.c. Compare the efficiency of energy production from various sources.
OB		PST.01.02. : Apply physical science laws and principles to identify, classify and use lubricants.
OB	1	PST.01.02.01.a. Classify lubricants by source, sustainability and equipment compatibility.
OB	2	PST.01.02.01.b. Classify lubricants by SAE viscosity and API service classifications.
OB	3	PST.01.02.01.c. Select, use and dispose of lubricants.
OC		PST.01.03. : Identify and use hand and power tools and equipment for service, construction and fabrication.
OC	1	PST.01.03.01.a. Identify and demonstrate safe use of measurement and layout tools.
OC	2	PST.01.03.01.b. Select, maintain and use hand and power tools in service, construction and fabrication.
OD		PST.02.01. : Perform service routines to maintain power units and equipment.
OD	1	PST.02.01.01.a. Identify power unit and equipment lubrication frequency.
OD	2	PST.02.01.01.b. Ensure the presence and function of safety systems and hardware on tools and equipment.
OD	3	PST.02.01.01.c. Test and service electrical systems. Check DVOM Basics
OD	4	PST.02.01.02.a. Service filtration systems and maintain fluid levels on power units and equipment.
OD	5	PST.02.01.02.b. Adjust equipment, including belts and drives, chains and sprockets, and maintain fluid conveyance components, such as hoses, lines and nozzles.
OD	6	PST.02.01.03.a. Maintain the cleanliness and appearance of power units and equipment to assure functionality.
OD	7	PST.02.01.03.b. Follow a preventive maintenance schedule for power units and equipment.
OE		PST.02.02. : Operate, service and diagnose the condition of power units and equipment.
OE	1	PST.02.02.01.a. Identify power unit and equipment controls and instruments, along with their functions using operation manual/service manual.
OE	2	PST.02.02.01.b. Perform start-up and shut-down procedures on power units and equipment as specified in technical manuals.

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OE	3	PST.02.02.02.a. Perform pre-operation inspection according to manufacturers' specifications and/or prevailing industry standards.
OE	4	PST.02.02.02.b. Demonstrate safe practices and regulations in the operation of power units and equipment.
OE	5	PST.02.02.02.c. Perform basic adjustments of equipment for safe and efficient operation. (shields, guards, etc.)
OF		PST.03.01. : Troubleshoot and repair internal combustion engines.
OF	1	PST.03.01.01.a. Identify components and systems of internal combustion engines.
OF	2	PST.03.01.01.b. Utilize technical manuals and computer-based diagnostics in engine analysis and repair.
OF	3	PST.03.01.01.c. Performance test internal combustion engines to determine service and repair basic spark, ignition, fuel, fire and compression.
OF	4	PST.03.01.02.a. Describe the operation of internal combustion engines by types of fuel used.
OF	5	PST.03.01.02.b. Analyze and troubleshoot internal combustion engines.
OG		PST.03.03. : Service and repair hydraulic and pneumatic systems.
OG	1	PST.03.03.01.b. Describe principles of hydraulic and pneumatic system operation.
OG	2	PST.03.03.01.c. Utilize symbols and schematic drawings in the maintenance of hydraulic and pneumatic systems. (basic ISO symbols)
OG	3	PST.03.03.03.b. Identify hydraulic and pneumatic system fittings and ports.
OH		PST.03.04. : Troubleshoot and service electrical systems. Math:
OH	1	PST.03.04.01.a. Apply the meaning and measurement of electricity, including amperage, voltage and wattage.
OH	2	PST.03.04.02.a. Identify the kinds and applications of electricity, including direct and alternating current.
OH	3	PST.03.04.02.b. Interpret basic electrical system symbols and diagrams.
OH	4	PST.03.04.02.c. Assess and repair malfunctioning electrical systems and components, such as battery, lighting, .
OH	5	PST.03.05. : Service vehicle heating and air-conditioning systems.
OI		PST.03.06. : Service and repair steering, suspension, traction and vehicle performance systems.
OI		PST.04.01. : Create sketches and plans of agricultural structures.
OI	1	PST.04.01.01.a. Identify symbols and drawing techniques used to develop plans and sketches. (blueprint basics)
OI	2	PST.04.01.01.a. Identify symbols and drawing techniques used to develop plans and sketches. (blueprint basics)
OI	3	PST.04.01.01.c. Apply basic principles of design, fabrication and installation of agricultural structures.
OI	4	PST.04.01.02.a. Prepare bills of materials to accompany plans and sketches.
OI	5	PST.04.01.02.b. Interpret scale measurement and dimension to develop plans and sketches.
OJ		PST.04.02. : Apply structural plans, specifications and building codes.
OJ	1	PST.04.02.01.a. Identify major parts of a construction drawing.
OJ	2	PST.04.02.01.b. Identify and interpret different views of a construction drawing.
OK		PST.04.03. : Examine structural requirements for materials and procedures and estimate construction cost.
OK	1	PST.04.03.01.a. Identify criteria in selecting materials in agricultural construction/fabrication.
OK	2	PST.04.03.01.b. Select types of materials, determine quantities and estimate their costs and other costs associated with a specified project plan.
OL		PST.04.04. : Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities.
OL	1	PST.04.04.01.a. Perform basic repair with wood and metal.
OL	2	PST.04.04.02.a. Identify electricity measurements and make measurement calculations. (use of Ohms Law)
OL	3	PST.04.04.02.b. Distinguish basic electrical circuits and components.
OL	4	PST.04.04.03.a. Calculate areas and volumes for coatings.
OL	5	PST.04.04.03.b. Paint or protect with coatings.
OL	6	PST.04.04.04.b. Identify insulation materials and methods to achieve desired R-value.
OL	7	PST.04.04.04.c. Insulate a structure.

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OL	8	PST.04.04.05.a. Measure and calculate materials for concrete, brick, stone or masonry units in agricultural construction.
OL	9	PST.04.04.06.a. Measure and calculate fencing materials.
OL	10	PST.04.04.06.b. Construct and/or repair fencing, including wood, static wire, electrical wire and other fencing materials.
OL	11	PST.04.04.07.a. Identify kinds and characteristics of metal materials.
OL	12	PST.04.04.07.b. Distinguish welding processes, positions, and materials preparation.
OL	13	PST.04.04.07.c. Construct and/or repair metal structures and equipment using welding fabrication procedures, including those associated with SMAW, GMAW, GTAW, fuel-oxygen and plasma arc torch methods.
OM		PST.05.01. : Use instruments and meters to test and monitor electrical and electronic processes.
OM	1	PST.05.01.01.a. Discuss various types and sources of electricity.
OM	2	PST.05.01.01.b. Use volt and amp meters and continuity testers to demonstrate electricity principles.
ON		PST.05.02. : Prepare and/or use electrical drawings to design, install and troubleshoot control systems.
ON	1	PST.05.02.01.a. Recognize common electrical symbols.
ON	2	PST.05.02.01.b. Read basic drawings for an electrical control system.
ON	3	PST.05.02.03.a. Identify hazards and safety practices in planning, installing and using electricity.
ON	4	PST.05.02.03.b. Distinguish materials and tools used in electrical installation.
ON	5	PST.05.02.04.a. Identify the importance and uses of computer-based systems in agriculture, food and natural resources.
OO		PST.05.03. : Use geospatial technologies in agricultural applications.
OO	1	PST.05.03.01.b. Explain and evaluate concepts and principles of geospatial technologies.
OO	2	PST.05.03.02.b. Describe equipment and processes used in geospatial technologies.
OO	3	PST.05.03.03.b. Describe principles of precision agriculture for map- and sensor-based systems.
OO	4	PST.05.03.04.a. Describe the meaning and use of sensors, controllers and actuators.

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AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	1	Read and process information and follow instructions.
AA	2	Read material and describe concepts.
AA	3	Use correct terminology.
AA	4	Use correct spelling, grammar, and punctuation.
AA	5	Write with accuracy, brevity, and clarity.
AA	6	Demonstrate knowledge of conflict resolution techniques.
AA	7	Possess basic computer keyboarding skills.
AA	8	Demonstrate understanding of basic interpersonal communication (listening, written, oral, etc.)
AA	9	Implement new process steps given oral instructions.
AA	10	Demonstrate the characteristics of a team player.
AA	11	Contrast the roles of a team with the role of an individual.
AA	12	Perform techniques used as a team leader.
AA	13	Organize and deliver a persuasive oral presentation.
AA	14	Demonstrate good speaking and presentation characteristics.
AA	15	Demonstrate basic leadership skills.
AA	16	Identify the organizational need for profit.
AA	17	Demonstrate use of an industry-accepted word processing software package.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	1	Add, subtract, multiply, and divide for digit numbers with or without the use of a calculator.
AB	2	Apply basic math functions to solve problems.
AB	3	Convert between US and metric measurement systems.
AB	4	Convert fractional measurement to decimal measurement.
AB	5	Compute within measurement systems.
AB	6	Document results of measurement activities and calculations.
AB	7	Calculate with percents, rate, ratio, and proportion with the use of a calculator.
AB	8	Make reasonable estimates.
AB	9	Compute calculated measurements.
EA		EXHIBIT WORKPLACE SKILLS
EA	1	Demonstrate consistently punctual arrival.
EA	2	Document regular attendance
EA	3	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	4	Demonstrate appropriate dress and hygiene for successful employment
EA	5	Demonstrate the ability to act in a polite and respectful way towards co-workers.
EA	6	Demonstrate the ability to complete tasks on time and accurately.
EA	7	Demonstrate the ability to make career decisions.
EA	8	Prepare a resume and letter of application or interest.
EA	9	Complete an application for employment.
EA	10	Participate in an employment interview.
EA	11	Follow directions and procedures.
EA	12	Accept constructive criticism.
EA	13	Work with minimal supervision.
EB		UNDERSTAND WORKPLACE ISSUES
EB	1	Recognize the difference between a team environment workplace and a conventional workplace.
EB	2	Identify the characteristics of a diverse workforce.
EB	3	Identify food ethical characteristics and behaviors.
EB	4	Differentiate between good and poor business ethics.
EB	5	Match employee responsibilities to employer expectations.
EB	6	Define discrimination, harassment, and equity.

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1006 Environmental Science/Natural Resources

EB	7	Demonstrate non-discriminatory behavior.
EB	8	Maintain confidentiality and sensitivity of company information.
EC		PERFORM BUSINESS PLANNING AND OPERATIONS PROCEDURES
EC	1	Plan and manage work schedules.
EC	2	Maintain receipts and disbursement records.
EC	3	Maintain inventory records.
EC	4	Maintain computer records.
EC	5	Identify possible actions that may lead to customer dissatisfaction.
EC	6	Identify the ways that the level of customer satisfaction may affect company success.
EC	7	Explain the importance of a business reputation.
EC	8	Identify possible actions that may be used to correct customer dissatisfaction.
EC	9	Identify the effect of quality on profit.
EC	10	Identify the effects of continuous quality improvement.
ED		DEMONSTRATE EFFECTIVE COMMUNICATION AND TEAMWORK SKILLS
ED	1	Organize materials with a logical flow.
ED	2	Interpret and clarify directions prepared by others.
ED	3	Communicate with customers.
ED	4	Write steps of an occupational process using sentences and statements as appropriate.
ED	5	Identify appropriate communication methods.
ED	6	Identify components of group dynamics.
ED	7	Demonstrate productive relationships within the work group.
EE		DEMONSTRATE PROBLEM SOLVING TECHNIQUES
EE	1	Apply a system of problem solving.
		Environmental Service Systems (ESS)
OA		ESS.01.01. : Analyze and interpret samples. Math: 1A, 1B, 4A and
OA	1	ESS.01.01.01.a. Identify sample types and sampling techniques, explain the importance of unbiased sampling and collect samples.
OA	3	ESS.01.01.01.b. Determine the appropriate sampling techniques needed to generate statistical analysis data, and prepare valid chemical laboratory samples according to instructions.
OA	4	ESS.01.01.01.c. Analyze and interpret results of sample measurements.
OA	5	ESS.01.01.02.a. Identify basic laboratory equipment and environmental monitoring instruments and explain their uses.
OA	6	ESS.01.01.02.b. Demonstrate the proper use and maintenance of basic laboratory equipment and environmental monitoring instruments.
OA	7	ESS.01.01.02.c. Calibrate and use laboratory and field equipment and instruments according to standard operating procedures.
OB		ESS.02.01. : Interpret federal, state, and local laws affecting environmental service systems.
OB	1	ESS.02.01.01.a. Identify laws associated with environmental service systems.
OB	2	ESS.02.01.01.b. Identify the purposes of laws associated with environmental service systems.
OB	3	ESS.02.01.01.c. Abide by the specific laws pertaining to environmental service systems.
OC		ESS.03.01. : Apply meteorology principles to environmental service systems.
OC	1	ESS.03.01.01.a. Identify components and structural layers of the earth's atmosphere.
OC	2	ESS.03.01.01.b. Differentiate the types of weather systems and weather patterns.
OC	3	ESS.03.01.02.a. Explain how meteorological conditions influence air quality.
OC	4	ESS.03.01.03.a. Explain climate change and recognize signs of climate change.
OC	5	ESS.03.01.03.b. Prepare a report on the environmental consequences of climate change.
OC	6	ESS.03.01.03.c. Evaluate the predicted impacts of global climate change on environmental service systems.
OC	7	ESS.03.01.04.a. Explain the earth's balance of energy.
OC	8	ESS.03.01.04.b. Explain the basics of the greenhouse effect and describe how the greenhouse effect alters the earth's balance of energy.

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OC	9	ESS.03.01.04.c. Explain processes that contribute to the change in levels of greenhouse gases.
OD		ESS.03.02. : Apply soil science principles to environmental service systems.
OD	1	ESS.03.02.01.a. Explain the process of soil formation through weathering.
OD	2	ESS.03.02.01.b. Differentiate rock types and relate the chemical composition of mineral matter in soils to the parent material.
OD	3	ESS.03.02.01.c. Apply knowledge of soil orders to environmental service systems.
OD	4	ESS.03.02.02.a. Describe the biodiversity found in soil and the contribution of biodiversity to the physical and chemical characteristics of soil.
OD	5	ESS.03.02.02.b. Relate the activities of microorganisms in soil to environmental service systems.
OD	6	ESS.03.02.02.c. Evaluate the uses of soil microorganisms in environmental service systems.
OD	7	ESS.03.02.03.a. Explain how the physical qualities of the soil influence the infiltration and percolation of water.
OD	8	ESS.03.02.03.b. Identify the physical qualities of the soil that determine its use for environmental service systems.
OD	9	ESS.03.02.03.c. Conduct tests of soil to determine its use for environmental service systems.
OD	10	ESS.03.02.04.a. Identify land uses, capability factors and land capability classes.
OD	11	ESS.03.02.04.b. Use a soil survey to determine the land capability classes for different parcels of land in an area.
OD	12	ESS.03.02.04.c. Design a master land-use management plan for a given area.
OD	13	ESS.03.02.05.a Explain sustainability of land uses.
OD	14	ESS.03.02.05.b Differentiate between sustainable and non sustainable land uses.
OD	15	ESS.03.02.05.c Determine maximum sustainable production levels under different resource conditions.
OE		ESS.03.03. : Apply hydrology principles to environmental service systems.
OE	1	ESS.03.03.01.a. Describe the world's water supplies and discuss the many uses of water.
OE	2	ESS.03.03.01.b. Describe characteristics of water that influence the biosphere and sustain life.
OE	3	ESS.03.03.01.c. Research and debate one or more current environmental issues associated with the supplies of groundwater and surface water.
OE	4	ESS.03.03.02.a. Demonstrate knowledge of hydrogeology by differentiating between groundwater and surface water.
OE	5	ESS.03.03.02.b. Describe interactions between groundwater and surface water.
OE	6	ESS.03.03.02.c. Use groundwater-flow equations and Darcy's Law to explain how geology and meteorology affect groundwater and groundwater flow.
OE	7	ESS.03.03.03.a. Define groundwater production potential.
OE	8	ESS.03.03.03.b. Identify differences in groundwater production potential.
OE	9	ESS.03.03.03.c. Delineate groundwater production potential zones.
OE	10	ESS.03.03.04.a. Identify environmental hazards associated with groundwater supplies.
OE	11	ESS.03.03.04.b. Describe precautions taken to prevent/reduce contamination of groundwater supplies.
OE	12	ESS.03.03.04.c. Test and document the quality of groundwater supplies.
OE	13	ESS.03.03.05.a. Discuss factors that influence the velocity of water through an open channel.
OE	14	ESS.03.03.05.b. Explain how the velocity of water influences channel morphology and stream processes.
OE	15	ESS.03.03.05.c. Measure and document water flow through an open channel and interpret channel-flow analysis.
OE	16	ESS.03.03.06.a. Identify the operational components of a pumping or fluid movement system.
OE	17	ESS.03.03.06.b. Discuss design principles related to hydraulic systems and highflow technologies related to fluid movement.
OE	18	ESS.03.03.06.c. Install and maintain pumps and associated delivery systems.
OF		ESS.03.04. : Apply best management techniques associated with the properties, classifications and functions of wetlands.
OF	1	ESS.03.04.01.a. Describe the functions of wetlands and differentiate types of wetlands.
OF	2	ESS.03.04.01.b. Explain the criteria for classifying wetlands.

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OF	3	ESS.03.04.01.c. Apply the Hydrogeomorphic (HGM) Approach and National Wetland Inventories (NWI) to determine the classifications for local wetlands.
OF	4	ESS.03.04.02.a. Identify the major types of living organisms that inhabit wetlands.
OF	5	ESS.03.04.02.b. Identify the predominant species in a local wetland.
OF	6	ESS.03.04.02.c. Conduct a survey of the predominant species in a local wetland.
OF	7	ESS.03.04.03.a. Explain the importance of wetland management, creation, enhancement and restoration programs.
OF	8	ESS.03.04.03.b. Identify techniques used in wetland management, creation, enhancement and restoration programs.
OF	9	ESS.03.04.03.c. Evaluate and document the condition of a local wetland and apply techniques to manage, create, enhance and/or restore local wetlands.
OG		ESS.03.05. : Apply chemistry principles to environmental service systems.
OG	1	ESS.03.05.01.a. Explain basic chemistry principles.
OG	2	ESS.03.05.01.b. Distinguish the characteristics of inorganic and organic compounds as they relate to environmental service systems.
OG	3	ESS.03.05.01.c. Apply standard operating procedures for use of chemicals in environmental service systems.
OH		ESS.03.06. : Apply microbiology principles to environmental service systems.
OH	1	ESS.03.06.01.a. Identify the basic structures of microorganisms and the major groups of microorganisms.
OH	2	ESS.03.06.01.b. Describe microbial growth in the environment and analyze the influence of environmental factors on microbial growth.
OH	3	ESS.03.06.01.c. Collect, culture and examine microorganisms, following safety procedures.
OH	4	ESS.03.06.02.a. Define the purposes of bioassay tests.
OH	5	ESS.03.06.02.b. Outline procedures for a bioassay test.
OH	6	ESS.03.06.02.c. Conduct bioassay tests related to environmental service systems and interpret results.
OI		ESS.04.01. : Use pollution control measures to maintain a safe facility and to prevent pollution of the environment.
OI	1	ESS.04.01.01.a. Identify types of pollution and distinguish between point source and nonpoint source pollution.
OI	2	ESS.04.01.01.b. Give examples of how industrial and nonindustrial pollution has damaged the environment.
OI	3	ESS.04.01.01.c. Survey the local area for evidence of industrial and nonindustrial pollution.
OI	4	ESS.04.01.02.a. Describe ways in which pollution can be managed and prevented.
OI	5	ESS.04.01.02.b. Conduct tests to determine the presence and extent of pollution.
OI	6	ESS.04.01.02.c. Plan and develop a pollution remediation, management or prevention program.
OJ		ESS.04.02. : Manage safe disposal of all categories of solid waste.
OJ	1	ESS.04.02.01.a. Describe different types of solid waste.
OJ	2	ESS.04.02.01.b. Evaluate environmental hazards created by different types of solid waste, solid waste accumulation and solid waste disposal.
OJ	3	ESS.04.02.01.c. Analyze environmental hazards associated with the identification and acceptance of solid waste disposal sites.
OJ	4	ESS.04.02.02.a. Discuss practical management options for treating solid waste.
OJ	5	ESS.04.02.02.b. Identify characteristics of solid waste treatment and recognize the byproducts of solid waste treatment.
OJ	6	ESS.04.02.02.c. Collect and treat solid waste materials.
OJ	7	ESS.04.02.03.a. Define sanitary landfill.
OJ	8	ESS.04.02.03.b. Explain basic sanitary landfill operating procedures and design.
OJ	9	ESS.04.02.03.c. Evaluate sanitary landfill procedures.
OJ	10	ESS.04.02.04.a. Define compost and composting.
OJ	11	ESS.04.02.04.b. Explain scientific principles related to composting.
OJ	12	ESS.04.02.04.c. Evaluate methods of operating a composting facility.
OJ	13	ESS.04.02.05.a. Explain the basic concepts associated with solid waste incineration.

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OJ	14	ESS.04.02.05.b. Describe the environmental impact of solid waste incineration.
OJ	15	ESS.04.02.05.c. Evaluate methods of incinerating solid waste, including those used in waste-to energy plants.
OJ	16	ESS.04.02.06.a. Explain the importance of recycling.
OJ	17	ESS.04.02.06.b. Describe recycling methods and identify materials that can be recycled.
OJ	18	ESS.04.02.06.c. Survey and evaluate local recycling programs and procedures.
OK		ESS.04.03. : Apply the principles of public drinking water treatment operations to ensure safe water at a facility.
OK	1	ESS.04.03.01.a. Identify chemical and physical properties of drinking water.
OK	2	ESS.04.03.01.b. Illustrate the steps in the public drinking water treatment process.
OK	3	ESS.04.03.01.c. Demonstrate the use of water-testing instruments and water-treatment equipment for processing public drinking water.
OK	4	ESS.04.03.02.a. Define source water quality.
OK	5	ESS.04.03.02.b. Define source water assessment steps.
OK	6	ESS.04.03.02.c. Conduct and interpret source water assessments.
OL		ESS.04.04. : Apply principles of wastewater treatment to manage wastewater disposal in keeping with rules and regulations.
OL	1	ESS.04.04.01.a. Define wastewater.
OL	2	ESS.04.04.01.b. Diagram the steps in wastewater treatment.
OL	3	ESS.04.04.01.c. Demonstrate the use of water-testing instruments and water-treatment equipment to treat wastewater.
OM		ESS.04.05. : Manage hazardous materials to assure a safe facility and to comply with applicable regulations.
OM	1	ESS.04.05.01.a. Identify types of hazardous materials.
OM	2	ESS.04.05.01.b. Describe risks related to hazardous materials and describe health and safety practices to reduce risks from hazardous materials.
OM	3	ESS.04.05.01.c. Describe the procedures for the treatment and disposal of hazardous materials and hazardous waste.
ON		ESS.05.01. : Compare and contrast the impact of conventional and alternative energy sources on the environment.
ON	1	ESS.05.01.01.a. Identify conventional energy sources and list conservation measures to reduce energy consumption.
ON	2	ESS.05.01.01.b. Identify advantages and disadvantages to conventional energy sources.
ON	3	ESS.05.01.01.c. Evaluate the impact the burning of fossil fuels has on the environment.
ON	4	ESS.05.01.02.a. Identify alternative energy sources.
ON	5	ESS.05.01.02.b. Identify advantages and disadvantages to alternative energy sources.
ON	6	ESS.05.01.02.c. Evaluate the impact of alternative energy sources on the environment.
OO		ESS.06.01. : Use technological and mathematical tools to map land, facilities and infrastructure.
OO	1	ESS.06.01.01.a. Explain the importance of surveying and mapping for environmental service systems.
OO	2	ESS.06.01.01.b. Explain surveying and mapping principles and identify and explain the use of equipment for surveying and mapping.
OO	3	ESS.06.01.01.c. Demonstrate surveying and cartographic skills to make site measurements and map facility accesses and infrastructure.
OP		ESS.06.02. : Maintain tools, equipment and machinery in safe working order for tasks in environmental service systems.
OP	1	ESS.06.02.01.a. Demonstrate proper use and maintenance of hand tools.
OP	2	ESS.06.02.01.b. Operate equipment and machinery in accordance with manufacturers' instructions and OSHA standards, specifically addressing personal protective equipment and proper machine guarding.
OP	3	ESS.06.02.01.c. Demonstrate proper preventive maintenance techniques and set up a mock preventive maintenance schedule.

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Natural Resource Systems (NRS)		
OQ		NRS.01.01. : Apply knowledge of natural resource
OQ	1	NRS.01.01.01.a. Identify natural resources.
OQ	2	NRS.01.01.01.b. Differentiate between renewable and nonrenewable natural resources.
OQ	3	NRS.01.01.01.c. Research and debate one or more current issues related to the conservation or preservation of natural resources.
OQ	4	NRS.01.01.02.a. Define ecosystem and related terms.
OQ	5	NRS.01.01.02.b. Describe the interdependence of organisms within an ecosystem.
OQ	6	NRS.01.01.02.c. Conduct a field study of an ecosystem, and record and document observations of species interactions.
OR		NRS.01.02. : Classify natural resources. Science: F3
OR	1	NRS.01.02.01.a. Describe morphological characteristics used to identify trees and other woody plants.
OR	2	NRS.01.02.01.b. Identify trees and other woody plants.
OR	3	NRS.01.02.01.c. Conduct a field inventory of trees and other woody plants, and record and document findings.
OR	4	NRS.01.02.02.a. Describe morphological characteristics used to identify herbaceous plants.
OR	5	NRS.01.02.02.b. Identify herbaceous plants.
OR	6	NRS.01.02.02.c. Conduct a field inventory of herbaceous plants, and record and document findings.
OR	7	NRS.01.02.03.a. Describe morphological characteristics used to identify wildlife species.
OR	8	NRS.01.02.03.b. Identify wildlife species.
OR	9	NRS.01.02.03.c. Conduct a field inventory of wildlife species, and record and document findings.
OR	10	NRS.01.02.04.a. Describe morphological characteristics used to identify aquatic species.
OR	11	NRS.01.02.04.b. Identify aquatic species.
OR	12	NRS.01.02.04.c. Conduct a field inventory of aquatic species, and record and document findings.
OR	13	NRS.01.02.05.a. Demonstrate techniques used to identify rock, mineral and soil types.
OR	14	NRS.01.02.05.b. Identify rock, mineral and soil types.
OR	15	NRS.01.02.05.c. Conduct a field inventory of rock, mineral and soil types, and record and document findings.
OS		NRS.02.01. : Develop a safety plan for work with natural resources.
OS	1	NRS.02.01.01.a. Identify hazards associated with the outdoor environment.
OS	2	NRS.02.01.01.b. Demonstrate safety practices when working in an outdoor environment.
OS	3	NRS.02.01.01.c. Demonstrate appropriate responses to accidents and injuries that occur in an outdoor environment.
OS	4	NRS.02.01.02.a. Recognize biohazards associated with natural resources.
OS	5	NRS.02.01.02.b. Use appropriate techniques and equipment when working with bio-hazards.
OS	6	NRS.02.01.02.c. Demonstrate appropriate responses for disasters involving bio-hazardous materials.
OT		NRS.02.02. : Demonstrate cartographic skills to aid in developing, implementing and evaluating natural resource management plans.
OT	1	NRS.02.02.01.a. Demonstrate how to use maps to identify directions and features, calculate actual distance and determine the elevations of points.
OT	2	NRS.02.02.01.b. Locate natural resources using a land survey and geographic coordinate system.
OT	3	NRS.02.02.01.c. Employ Global Positioning System and Geographic Information Systems technologies to inventory features in natural resource management.
OU		NRS.02.03. : Measure and survey natural resource status to obtain planning data.
OU	1	NRS.02.03.01.a. Describe the value of resource inventories and population studies.
OU	2	NRS.02.03.01.b. Discuss the procedures for conducting resource inventories and population studies.
OU	3	NRS.02.03.01.c. Conduct resource inventories and population studies to assess resource status.
OV		NRS.02.04. : Demonstrate natural resource enhancement techniques.
OV	1	NRS.02.04.01.a. Identify the different kinds and classification systems of streams.
OV	2	NRS.02.04.01.b. Identify indicators of the biological health of a stream.
OV	3	NRS.02.04.01.c. Create and implement a stream enhancement plan.

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OV	4	NRS.02.04.02.a. Identify characteristics of a healthy forest.
OV	5	NRS.02.04.02.b. Identify ways in which forest stands may be improved.
OV	6	NRS.02.04.02.c. Formulate a forest management plan.
OV	7	NRS.02.04.03.a. Identify characteristics of a healthy wildlife habitat.
OV	8	NRS.02.04.03.b. Identify methods of wildlife habitat improvement.
OV	9	NRS.02.04.03.c. Conduct a survey of a habitat and devise a comprehensive improvement plan.
OV	10	NRS.02.04.04.a. Identify characteristics of healthy rangeland.
OV	11	NRS.02.04.04.b. Identify methods of rangeland improvement.
OV	12	NRS.02.04.04.c. Evaluate a rangeland and develop a management plan for improvement.
OV	13	NRS.02.04.05.a. Identify natural resource characteristics desirable for recreational purposes.
OV	14	NRS.02.04.05.b. Identify natural resource management techniques for improving recreation opportunities.
OV	15	NRS.02.04.05.c. Evaluate the impact of recreational activities on natural resources and create an improvement plan.
OV	16	NRS.02.04.06.a. Identify characteristics of healthy marine and coastal natural resources.
OV	17	NRS.02.04.06.b. Identify methods to improve marine and coastal natural resources.
OV	18	NRS.02.04.06.c. Assess marine and coastal natural resources and prepare an improvement plan.
OW		NRS.02.05. : Interpret laws related to natural resource management and protection.
OW	1	NRS.02.05.01.a. Identify laws associated with natural resource systems.
OW	2	NRS.02.05.01.b. Identify the purposes of laws associated with natural resource systems.
OW	3	NRS.02.05.01.c. Abide by specific laws pertaining to natural resource systems.
OW	4	NRS.02.05.02.a. Define mitigation.
OW	5	NRS.02.05.02.b. Identify issues involving mitigation of natural resources.
OW	6	NRS.02.05.02.c. Demonstrate mitigation techniques for natural resources.
OX		NRS.02.06. : Apply ecological concepts and principles to natural resource systems.
OX	1	NRS.02.06.01.a. Identify biogeochemical cycles.
OX	2	NRS.02.06.01.b. Diagram biogeochemical cycles and explain the processes.
OX	3	NRS.02.06.01.c. Determine the human influence on biogeochemical cycles.
OX	4	NRS.02.06.02.a. Describe properties of watersheds and identify the boundaries of local watersheds.
OX	5	NRS.02.06.02.b. Describe the relationship of watersheds to natural resources.
OX	6	NRS.02.06.02.c. Analyze ecosystem functions of a watershed.
OX	7	NRS.02.06.03.a. Compare and contrast groundwater and surface-water flow.
OX	8	NRS.02.06.03.b. Explain stream and karst hydrology and structure, and determine the different classes of streams.
OX	9	NRS.02.06.03.c. Classify and predict the behavior of local streams.
OX	10	NRS.02.06.04.a. Define riparian zones and riparian buffers, and explain their functions.
OX	11	NRS.02.06.04.b. Identify techniques used in the creation, enhancement and management of riparian zones and riparian buffers.
OX	12	NRS.02.06.04.c. Create, enhance and manage riparian zones and riparian buffers.
OX	13	NRS.02.06.05.a. Describe the processes associated with ecological succession.
OX	14	NRS.02.06.05.b. Give examples of primary succession and secondary succession species in a community of organisms.
OX	15	NRS.02.06.05.c. Conduct a field study to determine the stages of ecological succession in a community of organisms.
OX	16	NRS.02.06.06.a. Explain population ecology, population density and population dispersion.
OX	17	NRS.02.06.06.b. Discuss factors that influence population density and population dispersion.
OX	18	NRS.02.06.06.c. Create and implement a management plan based on a population study for a community of organisms.
OX	19	NRS.02.06.07.a. Define and identify invasive species.
OX	20	NRS.02.06.07.b. Discuss factors that influence the establishment and spread of invasive species.
OX	21	NRS.02.06.07.c. Develop and implement a plan to reduce the impact of invasive species on natural

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		resources.
OX	22	NRS.02.06.08.a. Describe sources of pollution and define between point and nonpoint source pollution.
OX	23	NRS.02.06.08.b. Describe the impact of pollution on natural resources.
OX	24	NRS.02.06.08.c. Create and implement a plan to prevent or limit the effects of pollution on natural resources.
OX	25	NRS.02.06.09.a. Describe climatic factors that influence natural resources.
OX	26	NRS.02.06.09.b. Describe the impact climate has on natural resources.
OX	27	NRS.02.06.09.c. Monitor the effects of climate on plants and wildlife.
OY		NRS.03.01. : Produce, harvest, process and use natural resource products.
OY	1	NRS.03.01.01.a. Describe forest harvesting methods.
OY	2	NRS.03.01.01.b. Determine when to harvest forest products.
OY	3	NRS.03.01.01.c. Harvest forest products according to principles of sustainable forest management.
OY	4	NRS.03.01.02.a. Describe uses of tree species.
OY	5	NRS.03.01.02.b. Describe processing of forest products.
OY	6	NRS.03.01.02.c. Process forest products.
OY	7	NRS.03.01.03.a. Identify wildlife species that can be sustainably harvested.
OY	8	NRS.03.01.03.b. Describe techniques used in the harvesting of wildlife.
OY	9	NRS.03.01.03.c. Formulate a management plan for protecting wildlife from overexploitation.
OY	10	NRS.03.01.04.a. Identify products obtained from wildlife species.
OY	11	NRS.03.01.04.b. Describe techniques used in the processing of wildlife.
OY	12	NRS.03.01.04.c. Process harvested wildlife.
OY	13	NRS.03.01.05.a. Describe the value of minerals and ores to the economy.
OY	14	NRS.03.01.05.b. Describe economically important minerals and ores that are extracted and processed.
OY	15	NRS.03.01.05.c. Give examples of methods used to extract and process minerals and ores.
OY	16	NRS.03.01.06.a. Describe the value of fossil fuels to the economy.
OY	17	NRS.03.01.06.b. Describe sources of fossil fuels and products made from fossil fuels.
OY	18	NRS.03.01.06.c. Give examples of methods used to extract and process fossil fuels.
OY	19	NRS.03.01.07.a. Describe the benefits of non fossil fuel generation.
OY	20	NRS.03.01.07.b. Describe characteristics of sites that lend themselves to non fossil fuel generation.
OY	21	NRS.03.01.07.c. Describe non fossil fuel generation techniques and procedures, and prepare a report on the impacts of hydroelectric dams on aquatic systems.
OY	22	NRS.03.01.08.a. Identify recreational uses of natural resources.
OY	23	NRS.03.01.08.b. Debate an issue related to the recreational use of natural resources.
OY	24	NRS.03.01.08.c. Evaluate a natural resource site and recommend opportunities for recreational activities.
OY	25	NRS.03.01.09.a. Identify aquatic species harvested for commercial and recreational purposes.
OY	26	NRS.03.01.09.b. Describe techniques used to harvest aquatic species.
OY	27	NRS.03.01.09.c. Harvest aquatic species according to sustainable management principles.
OY	28	NRS.03.01.10.a. Identify uses of aquatic species.
OY	29	NRS.03.01.10.b. Explain techniques used to process aquatic species.
OY	30	NRS.03.01.10.c. Process harvested aquatic species.
OZ		NRS.04.01. : Manage fires in natural resource systems. Science:
OZ	1	NRS.04.01.01.a. Differentiate between desirable and undesirable fires and prepare a report on the role fire plays in an ecosystem.
OZ	2	NRS.04.01.01.b. Describe techniques used to suppress wildfires and manage prescribed fires.
OZ	3	NRS.04.01.01.c. Demonstrate the application of fire suppression and fire safety techniques.
OAA		NRS.04.02. : Diagnose plant and wildlife diseases and follow protocol to prevent their spread.
OAA	1	NRS.04.02.01.a. Identify causes of diseases in plants.
OAA	2	NRS.04.02.01.b. Report the observance of diseases affecting plants to the appropriate authorities.
OAA	3	NRS.04.02.01.c. Explain management techniques used to reduce infection and spread of plant diseases in natural resources.

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OAA	4	NRS.04.02.02.a. Identify causes of diseases in wildlife.
OAA	5	NRS.04.02.02.b. Report the observance of diseases affecting wildlife to the appropriate authorities.
OAA	6	NRS.04.02.02.c. Explain wildlife disease management techniques.
OAB		NRS.04.03. : Manage insect infestations of natural resources.
OAB	1	NRS.04.03.01.a. Identify harmful and beneficial insects and signs of insect damage to natural resources.
OAB	2	NRS.04.03.01.b. Report observance of insect pests to the appropriate authorities.
OAB	3	NRS.04.03.01.c. Describe techniques used to manage pests of natural resources.
OAC		NRS.05.01. : Communicate natural resource information to the public.
OAC	1	NRS.05.01.01.a. Identify ways in which a message regarding natural resources may be communicated to the public.
OAC	2	NRS.05.01.01.b. Design and construct a display that communicates a natural resource topic and discuss the topic in a public forum.
OAC	3	NRS.05.01.01.c. Communicate a natural resource message through the press, radio, television or public appearances.

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1007 Ag Education, Communications, Leadership

AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	1	Determine the appropriate mode of communication (e.g., print, electronic, face-to-face) for various workplace communications.
AA	2	Demonstrate appropriate etiquette when using e-communications (e.g., cell phone, e-mail, blackberries).
AA	3	Read and process information and follow instructions.
AA	4	Read material and describe concepts.
AA	5	Possess basic computer skills.
AA	6	Develop effective communication skills that include listening, active listening and nonverbal skills.
AA	7	Implement new process steps given oral instructions.
AA	8	Organize and deliver a persuasive oral presentation.
AA	9	Demonstrate proper speaking and presentation characteristics.
AA	10	Demonstrate basic leadership skills.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	1	Apply basic math functions to solve problems.
AB	2	Convert fractional measurement to decimal measurement.
AB	3	Compute within measurement systems (e.g., linear, volume, area, weight).
AB	4	Calculate with percents, rate, ratio, and proportion.
AB	5	Make reasonable estimates.
AB	6	Interpret and construct graphs from statistical data.
AC		DEMONSTRATE TECHNICAL LITERACY
AC	1	Write with accuracy, brevity, and clarity using appropriate terminology.
AC	2	Use correct spelling, grammar, and punctuation.
AC	3	Apply verbal skills to obtain and convey information. (e.g., ask relevant questions, interpret others' nonverbal cues, give verbal directions and defend ideas objectively)
AC	4	Record information to maintain and present business activity. (e.g., utilize note making strategies, organize information, select and use appropriate graphic aids)
AC	5	Prepare internal and external technical writing to convey and obtain information effectively (write professional e-mails, write executive summaries, prepare complex written reports, business plan).
AC	6	Utilize technical reading resources (e.g., Agricultural Research, Extension Publications, Progressive Farmer, Farmers Pride, and various types of business strategy books).
AC	7	Read to acquire meaning from written material and to apply the information to a task (e.g., extract relevant information from written materials).
EA		EXHIBIT WORKPLACE SKILLS
EA	1	Demonstrate personal work ethic, attendance, promptness, and willingness to follow instructions.
EA	2	Recognize the importance of time management.
EA	3	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	4	Demonstrate appropriate dress and hygiene for successful employment.
EA	5	Demonstrate the ability to act in a polite and respectful way toward co-workers.
EA	6	Demonstrate the ability to complete tasks with minimal supervision.
EA	7	Demonstrate the ability to make career decisions.
EA	8	Prepare a resume and letter of application or interest.
EA	9	Complete an application for employment.
EA	10	Participate in an employment interview.
EA	11	Follow internal policies and procedures.
EA	12	Develop skills to give and receive constructive criticism.
EB		UNDERSTAND WORKFORCE ISSUES
EB	1	Identify the characteristics of a diverse workplace.
EB	2	Identify good ethical characteristics and behaviors.
EB	3	Differentiate between good and poor business ethics.
EB	4	Describe techniques for demonstrating personal accountability and work productivity.

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EB	5	Define discrimination, harassment, and equity.
EB	6	Demonstrate non-discriminatory behavior.
EB	7	Maintain confidentiality and sensitivity of company information.
EC		DEMONSTRATE EFFECTIVE AND ETHICAL WORKPLACE RELATIONSHIPS
EC	1	Demonstrate the characteristics of a team player.
EC	2	Perform techniques used as a team leader.
EC	3	Identify components of group dynamics.
EC	4	Contrast the roles of a team with the roles of an individual.
EC	5	Demonstrate productive relationships within the work group.
EC	6	Demonstrate knowledge of conflict resolution techniques.
EC	7	Demonstrate appropriate employee interactions in workplace situations.
EC	8	Explain the importance of maintaining professionalism in work relationships.
EC	9	Assume shared responsibility for collaborative work.
EC	10	Demonstrate honesty and integrity.
ED		DEMONSTRATE CRITICAL THINKING AND PROBLEM SOLVING SKILLS
ED	1	Analyze information in order to solve problems and questions.
ED	2	Utilize critical thinking skills to determine best options/outcomes.
ED	3	Explain the need for innovation/creative skills.
EE		RECOGNIZE WORKPLACE DEVERITY
EE	1	Explain the importance of respect for feelings and beliefs of others.
EE	2	Identify strategies to bridge cultural differences and using differing perspectives to increase quality of work.
EE	3	Illustrate techniques for eliminating gender bias and stereotyping.
EE	4	Identify ways that tasks in the workplace environment can be structured to accommodate the diverse needs of workers.
EF		DEVELOP LIFE-LONG LEARNING SKILLS
EF	1	Demonstrate initiative to advance skill levels toward professional level.
EF	2	Define, prioritize and complete tasks without direct supervision.
EF	3	Demonstrate commitment to learning as a life-long process.
EF	4	Discuss how health, motivation, and physical fitness enhance performance.
EF	5	Discuss the importance of flexible career planning and career self-management.
EF	6	Describe the impact of the global economy on jobs and careers.
EF	7	Employ leadership skills to achieve workplace objectives (personal vision, adaptability, change, shared vision).
EF	8	Identify career opportunities resulting from new and emerging technologies.
EF	9	Understand the importance of job performance evaluation as it relates to career advancement.
OA		CS.01.01. : Action: Exhibit the skills and competencies needed to achieve a desired result.
OA	1	CS.01.01.01.a. Work productively with a group or independently.
OA	2	CS.01.01.01.b. Demonstrate the ability to complete a task without assistance.
OA	4	CS.01.01.02.a. Create a task analysis.
OA	5	CS.01.01.02.b. Create measurable objectives for a given situation.
OA	6	CS.01.01.02.c. Assess outcomes to determine success for a task.
OA	7	CS.01.01.03.a. Exhibit good planning skills for a specific task or situation.
OA	8	CS.01.01.03.b. Assess individual strengths and weaknesses in planning.
OA	9	CS.01.01.03.c. Implement an effective project plan.
OA	10	CS.01.01.04.a. Explore available resources to assist in meeting project needs.
OA	11	CS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.
OA	12	CS.01.01.04.c. Identify resources to complete an action or project.
OA	13	CS.01.01.05.a. Assess the physical, financial and professional risks/behaviors associated with a particular task.
OA	14	CS.01.01.05.b. Create a plan for performing a job that will minimize physical, financial and professional risks.
OA	15	CS.01.01.05.c. Implement a plan that minimizes physical, financial, and professional risks and analyze results.

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OA	16	Analyze results of a plan that minimizes physical, financial, and professional risks
OA	17	CS.01.01.06.a. Identify the strengths/talents of team members needed to achieve a desired task.
OA	18	CS.01.01.06.b. Assign project parts equitably amongst team members to achieve a given task.
OA	19	CS.01.01.06.c. Develop strengths and talents of team members so that all can achieve success.
OA	20	CS.01.01.07.a. Set personal goals using the SMART goals method (Specific, Measurable, Approved by you, Realistic, Time-stamped).
OA	21	CS.01.01.07.b. Use a variety of strategies to evaluate goals (e.g., observe, apply, and demonstrate).
OA	22	CS.01.01.07.c. Evaluate actions taken and make appropriate modifications to personal goals.
OB		CS.01.02. : Relationships: Build a constituency through listening, coaching, understanding and appreciating others.
OB	1	CS.01.02.01.a. Explain human relation skills such as compassion, empathy, unselfishness, trustworthiness, reliability and being friendly.
OB	2	CS.01.02.01.b. Determine/Identify human relation skills characteristics of people who exhibit compassion, empathy, unselfishness, trustworthiness, reliability and being friendly.
OB	3	CS.01.02.01.c. Demonstrate human relation skills including compassion, empathy, unselfishness, trustworthiness, reliability and being friendly to co-workers.
OB	4	CS.01.02.02.a. Engage in a conversation with others to identify their interests and aspirations.
OB	5	CS.01.02.02.b. Utilize communication skills to collaborate in a group setting.
OB	6	CS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.
OB	7	CS.01.02.03.a. Identify the steps/strategies to successfully coach/mentor others.
OB	8	CS.01.02.04.a. Identify characteristics of effective teams.
OB	9	CS.01.02.04.b. Establish team ground rules for expected individual behaviors on the team.
OB	10	CS.01.02.04.c. Evaluate the effectiveness of team members as a team member.
OC		CS.01.03. : Vision: Establish a clear image of what the future should look like.
OC	1	CS.01.03.01.a. Identify the benefits of developing vision.
OC	2	CS.01.03.01.b. Utilize visioning skills to develop a plan.
OC	3	CS.01.03.02.c. Create a plan of action to complete a task based on a conceptualized idea.
OC	4	CS.01.03.03.a. Analyze the risks and rewards of new experiences.
OC	5	CS.01.03.03.b. Analyze a case study involving a new experience for risk and rewards.
OC	6	CS.01.03.03.c. Conduct a self-evaluation for personal reactions to new experiences.
OC	7	CS.01.03.04.a. Describe techniques used to build consensus.
OC	8	CS.01.03.04.b. Demonstrate consensus building.
OC	9	CS.01.04.05.c. Lead a meeting or activity that engages all participants in the process.
OD		CS.01.04. : Character: Conduct professional and personal activities based on virtues.
OD	1	CS.01.04.01.a. Analyze a case study where integrity was demonstrated.
OD	2	CS.01.04.01.b. Explain a personal decision where integrity played a role in the decision.
OD	3	CS.01.04.01.c. Perform tasks with integrity.
OD	4	CS.01.04.02.a. Describe personal values.
OD	5	CS.01.04.02.b. Demonstrate the benefits of living by positive values.
OD	6	CS.01.04.02.c. Assess and analyze personal values.
OD	7	CS.01.04.03.a. Identify the consequences of personal actions.
OD	8	CS.01.04.03.b. Assess the alternative outcome of specific actions.
OD	9	CS.01.04.03.c. Analyze the causes for team members to accept or reject responsibility.
OD	10	CS.01.04.04.a. Explain the benefits of mutual respect.
OD	11	CS.01.04.04.b. Analyze how respect is given.
OD	12	CS.01.04.04.c. Demonstrate respect for others.
OD	13	CS.01.04.05.a. Practice self-discipline.
OD	14	CS.01.04.05.b. Differentiate between habits, practices and behaviors consistent with principles of self-discipline.
OD	15	CS.01.04.05.c. Analyze one's level of self-discipline and causes for lack of self discipline.

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OD	16	CS.01.04.06.a. Describe the benefits of serving others.
OD	17	CS.01.04.06.b. Develop personal goals that include service to others.
OD	18	CS.01.04.06.c. Evaluate professional and personal values and how they are applied in the service to others.
OE		CS.01.05. : Awareness: Desire purposeful understanding related to professional and personal activities.
OE	1	CS.01.05.01.a. Discuss trends and issues important to the community.
OE	2	CS.01.05.01.b. Analyze the impact of trends and issues on the community.
OE	3	CS.01.05.01.c. Articulate current issues that are important to the local, state, national and global communities.
OE	4	CS.01.05.02.a. Identify civic leadership role opportunities.
OE	5	CS.01.05.02.b. Demonstrate responsible citizenship.
OE	6	CS.01.05.02.c. Perform leadership tasks associated with citizenship.
OE	7	CS.01.05.03.a. Explain benefits and challenges of working in a diverse group.
OE	8	CS.01.05.03.b. Engage in activities to help develop personal awareness of diversity.
OE	9	CS.01.05.03.c. Plan an activity that promotes appreciation of diversity.
OF		CS.01.06. : Continuous Improvement: Pursue learning and growth opportunities related to professional and personal aspirations.
OF	1	CS.01.06.01.a. Explain the reasons for having a leadership/personal growth plan.
OF	2	CS.01.06.01.b. Develop a plan that includes specific goals for leadership and personal growth.
OF	3	CS.01.06.01.c. Implement a leadership and personal growth plan.
OF	4	CS.01.06.02.a. Describe the role and purpose of a personal mentor.
OF	5	CS.01.06.02.b. Identify areas where a personal mentor could be helpful.
OF	6	CS.01.06.02.c. Serve as a mentor for others.
OF	7	CS.01.06.03.a. Identify the different types of problem solving models and their applicability to specific situations.
OF	8	CS.01.06.03.b. Utilize a problem-solving model to solve a given problem.
OF	9	CS.01.06.03.c. Use problem solving strategies to solve a professional or personal issue.
OF	10	CS.01.06.04.a. Use various emerging technologies to enhance a program or project.
OF	11	CS.01.06.04.b. Evaluate the effectiveness of current technologies.
OF	12	CS.01.06.04.c. Make recommendations to adopt new emerging technologies.
OF	13	CS.01.06.05.a. Describe the value of being a life-long learner and the need for continuous development.
OF	14	CS.01.06.05.c. Implement a plan to develop new knowledge and skills related to professional and personal aspirations.
OG		CS.03.01. : Communication: Demonstrate oral, written and verbal skills.
OG	1	CS.03.01.01.a. Use basic technical and business writing skills.
OG	2	CS.03.01.01.b. Select the appropriate form of technical and business writing or communication for a specific situation.
OG	3	CS.03.01.01.c. Demonstrate technical and business writing skills to communicate effectively with co-workers and supervisors.
OG	4	CS.03.01.02.a. Describe the various types and uses of resumes.
OG	5	CS.03.01.02.b. Prepare a resume.
OG	6	CS.03.01.02.c. Demonstrate effective use of a resume as part of an effort to obtain a job.
OG	7	CS.03.01.03.a. Develop an outline or plan for a business presentation.
OG	8	CS.03.01.03.b. Deliver a business presentation for a peer group (e.g., class presentation).
OH		CS.03.02. : Decision Making – Analyze situations and execute an appropriate course of action.
OH	1	CS.03.02.01.a. Analyze the steps in the decision-making process.
OH	2	CS.03.02.01.b. Utilize the process used to reach a conclusion for a decision.
OH	3	CS.03.02.01.c. Make decisions for a given situation by applying the decision making process.
OH	4	CS.03.02.02.a. Select resources to help in the problem-solving process.
OH	5	CS.03.02.02.b. Determine information that is critical to solving problems.

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OH	6	CS.03.02.02.c. Use problem-solving skills.
OH	7	CS.03.02.03.a. Differentiate between ethical and unethical behavior.
OH	8	CS.03.02.03.b. Practice ethical behaviors.
OH	9	CS.03.02.03.c. Examine an ethical dilemma and prepare an argument for a position.
OH	10	CS.03.02.04.a. Use an interest inventory to determine goals appropriate to personal passions, abilities and aptitudes.
OH	11	CS.03.02.04.b. Assess personal skills to set goals for success in a career.
OH	12	CS.03.02.04.c. Implement appropriate preparation plans for a career path based on passion, abilities, aptitude, opportunities.
OI		CS.03.03. : Flexibility / Adaptability: Describe traits that enable one to be capable and willing to accept change.
OI	1	Identify proper sources for research.
OI	2	CS.03.03.01.a. Research current and emerging technologies in AFNR.
OI	3	CS.03.03.01.c. Conduct a workplace study to assess the benefits to adapting emerging technologies.
OI	4	CS.03.03.02.c. Evaluate strategies that can be used to manage change within the workplace.
OI	5	CS.03.03.03.a. Identify the value of providing feedback.
OI	6	CS.03.03.03.b. Differentiate between positive and negative constructive feedback and realize the importance of both.
OI	7	CS.03.03.03.c. Respond to feedback to improve a situation, skill or performance.
OJ		CS.04.01. : Examine performance and goals to appreciate organizations and industries within AFNR.
OJ	1	CS.04.01.01.a. Examine performance and goals to appreciate professional organizations and industries within AFNR.
OJ	2	CS.04.01.01.b. Explain the major guidelines used by AFNR professional organizations to manage and improve performance.
OJ	3	CS.04.01.01.c. Examine economic, social and technological changes and spotlight their impact on AFNR professional organizations and the industry.
OK		Principles of Teaching Agriculture Education
OK	1	Develop a basic lesson plan and assessment using strategies/methods taught in an agriculture class.
OK	2	Teach a lesson using the lesson plan developed by the student.
OK	3	Describe the characteristics of an effective Agriculture teacher.
OK	4	Trace through time the history of Agricultural education.
OK	5	Describe the basic requirements to become an Agriculture teacher.
OK	6	Identify the qualities of teacher professionalism and leadership.
OK	7	Explore diversity and its implications in the classroom, including diverse teaching methods.
OK	8	Observe, interact and reflect on teaching and learning in classrooms.
OK	9	Describe how education systems are organized.
OK	10	Identify issues and challenges in education and agricultural education today.
OK	11	Identify career opportunities for educators.
OK	12	Develop a four-year post-secondary plan.
OK	13	Utilize activities of the FFA as an integral component of course content and leadership development.
OK	14	Apply math, science and communication skills within technical content.
OK	15	Demonstrate employability and social skills relevant to the career cluster.
OK	16	Maintain records on supervised agricultural experience program and be able to summarize and analyze results in making financial decisions.
OK	17	Explore the role of an organization (FFA, 4-H, etc.).
OK	18	Assist students in planning a project (supervised agricultural experience).
OL		Agricultural Communications
OL	1	Demonstrate employability and social skills relative to the career cluster.
OL	2	Develop skills in public, extemporaneous and impromptu speaking.

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OL	3	Communicate to resolve conflict and promote team building.
OL	4	perform computer skills related to word processing, desktop publishing,
OL	5	Create basic multimedia presentations and computer graphics.
OL	6	Develop skills related to proper telephone, cell phone and email usage.
OL	7	Develop basic skills to produce print quality newspaper and magazine articles.
OL	8	Develop basic skills to produce brochures and sale ads.
OL	9	Develop skills for photography used in communications.
OL	10	Interview a resource person to gather information.
OL	11	Utilize skills developed to write and produce radio and television ads/promotions.
OL	12	Develop basic skills to write a press release.
OL	13	Describe proper uses of social networking sites.
OL	14	Utilize the Internet for research, E-mail, and basic communication processes.
OL	15	Understand how non-verbal communication plays a part in interpersonal development.
OL	16	Conduct meetings by using parliamentary procedure.
OL	17	Learn to develop and complete professional quality resumes.
OL	18	Demonstrate the ability to do market research and organization for presentations.
OL	19	Plan, organize and deliver a sales presentation.
OL	20	Maintain records on supervised agricultural experience program and be able to summarize and analyze results in making financial decisions.
OL	21	Utilize activities of FFA as an integral component of course content and leadership development.
OL	22	Apply science, math and communication skills within the technical content.

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AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	1	Read and process information and follow instructions.
AA	2	Read material and describe concepts.
AA	3	Use correct terminology.
AA	4	Use correct spelling, grammar, and punctuation.
AA	5	Write with accuracy, brevity, and clarity.
AA	6	Demonstrate knowledge of conflict resolution techniques.
AA	7	Possess basic computer keyboarding skills.
AA	8	Demonstrate understanding of basic interpersonal communication (listening, written, oral, etc.)
AA	9	Implement new process steps given oral instructions.
AA	10	Demonstrate the characteristics of a team player.
AA	11	Contrast the roles of a team with the role of an individual.
AA	12	Perform techniques used as a team leader.
AA	13	Organize and deliver a persuasive oral presentation.
AA	14	Demonstrate good speaking and presentation characteristics.
AA	15	Demonstrate basic leadership skills.
AA	16	Identify the organizational need for profit.
AA	17	Demonstrate use of an industry-accepted word processing software package.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	1	Add, subtract, multiply, and divide for digit numbers with or without the use of a calculator.
AB	2	Apply basic math functions to solve problems.
AB	3	Convert between US and metric measurement systems.
AB	4	Convert fractional measurement to decimal measurement.
AB	5	Compute within measurement systems.
AB	6	Document results of measurement activities and calculations.
AB	7	Calculate with percents, rate, ratio, and proportion with the use of a calculator.
AB	8	Make reasonable estimates.
AB	9	Compute calculated measurements.
EA		EXHIBIT WORKPLACE SKILLS
EA	1	Demonstrate consistently punctual arrival.
EA	2	Document regular attendance
EA	3	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	4	Demonstrate appropriate dress and hygiene for successful employment
EA	5	Demonstrate the ability to act in a polite and respectful way towards co-workers.
EA	6	Demonstrate the ability to complete tasks on time and accurately.
EA	7	Demonstrate the ability to make career decisions.
EA	8	Prepare a resume and letter of application or interest.
EA	9	Complete an application for employment.
EA	10	Participate in an employment interview.
EA	11	Follow directions and procedures.
EA	12	Accept constructive criticism.
EA	13	Work with minimal supervision.
EA	14	Demonstrate the ability for self motivation.
EB		UNDERSTAND WORKPLACE ISSUES
EB	1	Recognize the difference between a team environment workplace and a conventional workplace.
EB	2	Identify the characteristics of a diverse workforce.

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EB	3	Identify good ethical characteristics and behaviors.
EB	4	Differentiate between good and poor business ethics.
EB	5	Match employee responsibilities to employer expectations.
EB	6	Define discrimination, harassment, and equity.
EB	7	Demonstrate non-discriminatory behavior.
EB	8	Maintain confidentiality and sensitivity of company information.
EC		PERFORM BUSINESS PLANNING AND OPERATIONS PROCEDURES
EC	1	Plan and manage work schedules.
EC	2	Maintain receipts and disbursement records.
EC	3	Maintain inventory records.
EC	4	Maintain computer records.
EC	5	Identify possible actions that may lead to customer dissatisfaction.
EC	6	Identify the ways that the level of customer satisfaction may affect company success.
EC	7	Explain the importance of a business reputation.
EC	8	Identify possible actions that may be used to correct customer dissatisfaction.
EC	9	Identify the effect of quality on profit.
EC	10	Identify the effects of continuous quality improvement.
ED		DEMONSTRATE EFFECTIVE COMMUNICATION AND TEAMWORK SKILLS
ED	1	Organize materials with a logical flow.
ED	2	Interpret and clarify directions prepared by others.
ED	3	Communicate with customers.
ED	4	Write steps of an occupational process using sentences and statements as appropriate.
ED	5	Identify appropriate communication methods.
ED	6	Identify components of group dynamics.
ED	7	Demonstrate productive relationships within the work group.
EE		DEMONSTRATE PROBLEM SOLVING TECHNIQUES
EE	1	Apply a system of problem solving.
OA		FPP.01.01. : Evaluate the significance and implications of changes and trends in the food products and processing industry.
OA	1	FPP.01.01.01.a. Discuss the history and describe and explain the components (e.g., processing, distribution, byproducts) of the food products and processing industry.
OA	2	FPP.01.01.01.b. Evaluate changes and trends in the food products and processing industry.
OA	3	FPP.01.01.01.c. Predict trends and implications in the food products and processing industry.
OA	4	FPP.01.01.02.a. Identify and explain environmental and safety concerns about the food supply.
OA	5	FPP.01.01.02.b. Discuss the issues of safety and environmental concerns about foods and food processing (e.g., Genetically Modified Organisms, microorganisms, contamination, irradiation).
OA	6	FPP.01.01.02.c. Determine appropriate industry response to consumer concerns to assure a safe and wholesome food supply.
OB		FPP.01.02. : Work effectively with industry organizations, groups and regulatory agencies affecting the food products and processing industry.
OB	1	FPP.01.02.01.a. Explain the purposes of agencies that are part of or regulate the food products and processing industry. (i.e. USDA, FDA, WHO)
OB	2	FPP.01.02.01.b. Evaluate the changes in the food products and processing industry brought about by industry organizations or regulatory agencies.
OB	3	FPP.01.02.01.c. Interact effectively with organizations, groups and regulatory agencies that affect the food products and processing industry.

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OB	4	FPP.01.02.02.a. Explain the importance and usage of industry standards in food products and processing.
OB	5	FPP.01.02.02.b. Discuss the application of industry standards in the food products and processing industry.
OB	6	FPP.01.02.02.c. Prepare a plan for implementation of industry standards in food products and processing programs.
OC		FPP.02.01. : Manage operational procedures and create equipment and facility maintenance plans.
OC	1	FPP.02.01.01.a. Explain the importance of developing and maintaining Sanitation Standard Operating Procedures (SSOP).
OC	2	FPP.02.01.01.b. Evaluate the SSOP of a food products and processing company.
OC	3	FPP.02.01.01.c. Develop SSOP for a food products and processing company.
OC	4	FPP.02.01.02.a. Explain the purpose of Good Manufacturing Practices (GMP).
OC	5	FPP.02.01.02.b. Evaluate the GMP of a food products and processing company.
OC	6	FPP.02.01.02.c. Implement GMP for a food products and processing company.
OC	7	FPP.02.01.03.a. Identify reasons for using a planned maintenance program to maintain equipment and facilities.
OC	8	FPP.02.01.03.b. Develop a basic equipment and facility maintenance program.
OC	9	FPP.02.01.03.c. Perform basic equipment and facility maintenance in a food products and processing operation.
OD		FPP.02.02. : Implement Hazard Analysis and Critical Control Point (HACCP) procedures to establish operating parameters.
OD	1	FPP.02.02.01.a/b. Describe contamination hazards and outline procedures to eliminate possible contamination hazards (physical, chemical and biological) associated with food products and processing.
OD	2	FPP.02.02.01.c. Analyze the effectiveness of a food products and processing company's Critical Control Point (CCP) procedures.
OD	3	FPP.02.02.02.a/b. Identify and explain the implementation of the seven principles of HACCP.
OD	4	FPP.02.02.02.c. Implement an HACCP program for a food products and processing facility.
OE		FPP.02.03. : Apply safety and sanitation procedures in the handling, processing and storing of food products.
OE	1	FPP.02.03.01.a. Explain techniques and procedures for the safe handling of food products.
OE	2	FPP.02.03.01.b. Evaluate food product handling procedures.
OE	3	FPP.02.03.01.c. Demonstrate approved food product handling techniques.
OE	4	FPP.02.03.02.a. Describe the importance of performing quality-assurance tests on food products.
OE	5	FPP.02.03.02.b. Perform quality-assurance tests on food products.
OE	6	FPP.02.03.02.c. Interpret quality-assurance test results and apply corrective procedures.
OE	7	FPP.02.03.03.a. Describe the effects food-borne pathogens have on food products and humans. (surfaces, environmental and food products)
OE	8	FPP.02.03.03.b. Explain the importance of microbiological tests in food product preparation, listing common spoilage and pathogenic microorganisms.
OE	9	FPP.02.03.03.c. Conduct and interpret microbiological tests for food-borne pathogens and implement corrective procedures.
OE	10	FPP.02.03.04.a. Explain the importance of record keeping in a food products and processing system. (good agricultural practices, HACCP, etc.)
OE	11	FPP.02.03.04.b. Discuss documentation procedures in a food products and processing system. (good agricultural practices, HACCP, etc.)

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OE	12	FPP.02.03.04.c. Demonstrate proper record keeping in a food products and processing system. (good agricultural practices, HACCC, etc.)
OE	13	Describe the importance of and difference of performing quality assurance and quality control tests.
OE	14	Interpret the importance of and difference of performing quality assurance and quality control tests.
OE	15	Perform the importance of and difference of performing quality assurance and quality control tests.
OF		FPP.02.04. : Demonstrate worker safety procedures with food product and processing equipment and facilities.
OF	1	FPP.02.04.01.a. Explain safety standards that must be observed in facility design and equipment use.
OF	2	FPP.02.04.01.b. Outline guidelines for personnel safety in the food products and processing industry.
OF	3	FPP.02.04.01.c. Evaluate a facility to determine the implementation of safety procedures.
OG		FPP.03.01. : Apply principles of science to food processing to provide a safe, wholesome and nutritious food supply.
OG	1	FPP.03.01.01.a. Discuss how research and industry developments lead to improvements in the food products and processing industry.
OG	2	FPP.03.01.01.b. Design a research project in food science using the scientific method.
OG	3	FPP.03.01.01.c. Conduct research in food science and interpret results to improve food products.
OG	4	FPP.03.01.02.a. Explain the application of chemistry to food science.
OG	5	FPP.03.01.02.b. Explain how the chemical and physical properties of foods influence nutritional value and eating quality.
OG	6	FPP.03.01.02.c. Determine the chemical and physical properties of food products.
OG	7	FPP.03.01.03.a. Explain the Food Guide Pyramid in relation to essential nutrients for the human diet.
OG	8	FPP.03.01.03.b. Compare and contrast the nutritive value of food and food groups.
OG	9	FPP.03.01.03.c. Design a daily food guide for a healthful diet.
OG	10	FPP.03.01.04.a. Discuss common food constituents (e.g., proteins, carbohydrates, fats, vitamins, minerals).
OG	11	FPP.03.01.04.b. Compare and contrast food constituents and their relative value to product taste, appearance, etc.
OG	12	FPP.03.01.04.c. Analyze food products to identify food constituents.
OG	13	FPP.03.01.05.a. Identify common food additives and the legal limits (e.g., preservatives, antioxidants, buffers, stabilizers, colors, flavors).
OG	14	FPP.03.01.05.b. Describe the purpose of common food additives.
OG	15	FPP.03.01.05.c. Formulate and explain incorporation of additives into food products.
OG	16	FPP.03.01.06.a. Explain the importance of food labeling including allergies to the consumer.
OG	17	FPP.03.01.06.b. Explain the required components of a food label.
OG	18	FPP.03.01.06.c. Prepare and label foods according to the established standards of regulatory agencies.
OG	19	FPP.03.01.07.a. Describe factors in planning and developing a new food product (e.g., regulation, creativity, and economics).
OG	20	FPP.03.01.07.b. Plan and create a new food product.
OG	21	FPP.03.01.07.c. Perform sensory-testing and marketing functions to characterize and determine consumer preference and market potential.
OH		FPP.04.01. : Utilize harvesting, selection and inspection techniques to obtain quality food products for processing.
OH	1	FPP.04.01.01.a. Identify quality and yield grades of food products.
OH	2	FPP.04.01.01.b. Discuss factors that affect quality and yield grades of food products.
OH	3	FPP.04.01.01.c. Assign quality and yield grades to food products according to industry standards.
OH	4	FPP.04.01.02.a. Select raw food products based on yield grades, quality grades and related selection criteria.

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OH	5	FPP.04.01.02.b. Perform quality-control inspections of raw food products for processing.
OH	6	FPP.04.01.02.c. Implement procedures to maintain original food quality and yield.
OH	7	FPP.04.01.03.a. Identify and describe accepted animal treatment and harvesting techniques.
OH	8	FPP.04.01.03.b. Compare and contrast accepted animal treatment and harvesting techniques.
OH	9	FPP.04.01.03.c. Harvest animals using regulatory agency approved techniques.
OH	10	FPP.04.01.04.a. Describe the importance of pre-mortem and post-mortem inspections of animals for harvest.
OH	11	FPP.04.01.04.b. Explain observations and the process of both pre-mortem and post-mortem inspection of animals in relation to the production of food products.
OH	12	FPP.04.01.04.c. Conduct pre-mortem and postmortem inspections of animals.
OI		FPP.04.02. : Evaluate, grade and classify processed food products.
OI	1	FPP.04.02.01.a. Identify and describe foods derived from meat, egg, poultry, fish and dairy products.
OI	2	FPP.04.02.01.b. Discuss desirable qualities of processed meat, egg, poultry, fish and dairy products.
OI	3	FPP.04.02.01.c. Evaluate, grade and classify processed meat, egg, poultry, fish and dairy products.
OI	4	FPP.04.02.02.a. Identify and describe products derived from fruits and vegetables.
OI	5	FPP.04.02.02.b. Discuss desirable qualities of fruit and vegetable products.
OI	6	FPP.04.02.02.c. Evaluate, grade and classify processed products from fruits and vegetables.
OI	7	FPP.04.02.03.a. Identify and describe products derived from grains, legumes and oilseeds.
OI	8	FPP.04.02.03.b. Discuss desirable qualities of grain, legume and oilseed products.
OI	9	FPP.04.02.03.c. Evaluate, grade and classify finished products derived from grains, legumes and oilseeds.
OJ		FPP.04.03. : Process, preserve, package and present food and food products for sale and distribution.
OJ	1	FPP.04.03.01.a. Identify and explain common weights and measures used in the food products and processing industry.
OJ	2	FPP.04.03.01.b. Weigh and measure food products and perform conversions between units of measure.
OJ	3	FPP.04.03.01.c. Use weights and measures to formulate and package food products.
OJ	4	FPP.04.03.02.a. Explain methods and materials for processing foods for sale as fresh-food products.
OJ	5	FPP.04.03.02.b. Prepare foods for sale and distribution as fresh-food products.
OJ	6	FPP.04.03.02.c. Evaluate foods prepared for the fresh food market based on factors such as shelf life, shrinkage, appearance and weight.
OJ	7	FPP.04.03.03.a. Identify methods of food preservation and give examples of foods preserved by each method.
OJ	8	FPP.04.03.03.b. Explain the processes of food preservation methods.
OJ	9	FPP.04.03.03.c. Preserve foods using various methods and techniques.
OJ	10	FPP.04.03.04.a. Explain techniques for preparing ready-to-eat food products.
OJ	11	FPP.04.03.04.b. Demonstrate techniques of preparing ready-to-eat food products.
OJ	12	FPP.04.03.04.c. Evaluate ready-to-eat food products.
OJ	13	FPP.04.03.05.a. Explain materials and methods of food packaging and presentation.
OJ	14	FPP.04.03.05.b. Select and utilize packaging materials in storing processed foods and raw food products.
OJ	15	FPP.04.03.05.c. Analyze the foods stored in various packaging materials to determine which materials retain desirable food qualities.
OJ	16	FPP.04.03.06.a. Identify and explain storage conditions to preserve product quality.
OJ	17	FPP.04.03.06.b. Select methods and conditions for storing raw and processed food products.
OJ	18	FPP.04.03.06.c. Compare and contrast foods stored under varying conditions for quality, shelf life and intended use.

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AA		UTILIZE EFFECTIVE WORKPLACE COMMUNICATION SKILLS
AA	1	Read and process information and follow instructions.
AA	2	Read material and describe concepts.
AA	3	Use correct terminology.
AA	4	Use correct spelling, grammar, and punctuation.
AA	5	Write with accuracy, brevity, and clarity.
AA	6	Demonstrate knowledge of conflict resolution techniques.
AA	7	Possess basic computer keyboarding skills.
AA	8	Demonstrate understanding of basic interpersonal communication (listening, written, oral, etc.)
AA	9	Implement new process steps given oral instructions.
AA	10	Demonstrate the characteristics of a team player.
AA	11	Compare the roles of a team with the role of an individual.
AA	12	Perform techniques used as a team leader.
AA	13	Organize and deliver a persuasive oral presentation.
AA	14	Demonstrate good speaking and presentation characteristics.
AA	15	Demonstrate basic leadership skills.
AA	16	Identify the organizational need for profit.
AA	17	Demonstrate use of an industry-accepted word processing software package.
AB		APPLY MATH AND MEASUREMENT SKILLS
AB	1	Add, subtract, multiply, and divide four digit numbers with or without the use of a calculator.
AB	2	Apply basic math functions to solve problems.
AB	3	Convert between US and metric measurement systems.
AB	4	Convert fractional measurement to decimal measurement.
AB	5	Compute within measurement systems.
AB	6	Document results of measurement activities and calculations.
AB	7	Calculate with percents, rate, ratio, and proportion with the use of a calculator.
AB	8	Make reasonable estimates.
AB	9	Compute measurements.
AC		APPLY BASIC SCIENCE CONCEPTS AND SKILLS
AC	1	Identify scientific plant and animal classification.
AC	2	Compare the anatomical parts and distinguishing characteristics of plants and animals.
AC	3	Explain the reproductive processes of plants and animals.
AC	4	Analyze the process of plant and animal growth and development.
AC	5	Be aware of biotechnology and its uses in production agriculture.
AC	6	Explain the use of applied genetics in plants and animals.
AC	7	Be aware of biotechnology and its uses in the horticulture production.
AC	8	Explain the use of applied genetics in horticulture.
EA		EXHIBIT WORKPLACE SKILLS
EA	1	Demonstrate consistently punctual arrival.

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EA	2	Implement responsibility of job position including exhibiting dependability and meeting organizationally defined expectations.
EA	3	Demonstrate enthusiasm and confidence about work and learning new tasks.
EA	4	Demonstrate appropriate dress and hygiene for successful employment
EA	5	Demonstrate the ability to act in a polite and respectful way towards co-workers.
EA	6	Demonstrate the ability to complete tasks on time and accurately.
EA	7	Demonstrate the ability to make career decisions.
EA	8	Prepare a resume and letter of application or interest.
EA	9	Complete an application for employment.
EA	10	Participate in an employment interview.
EA	11	Follow directions and procedures.
EA	12	Accept constructive criticism.
EA	13	Work with minimal supervision.
EB		UNDERSTAND WORKPLACE ISSUES
EB	1	Recognize the difference between a team environment workplace and a conventional workplace.
EB	2	Identify the characteristics of a diverse workforce.
EB	3	Identify ethical characteristics and behaviors.
EB	4	Differentiate between good and poor business ethics.
EB	5	Match employee responsibilities to employer expectations.
EB	6	Define discrimination, harassment, and equity.
EB	7	Demonstrate non-discriminatory behavior.
EB	8	Maintain confidentiality and sensitivity of company information.
EC		PERFORM BUSINESS PLANNING AND OPERATIONS PROCEDURES
EC	1	Plan and manage work schedules.
EC	2	Maintain receipts and disbursement records.
EC	3	Maintain inventory records.
EC	4	Maintain computer records.
EC	5	Identify possible actions that may lead to customer dissatisfaction.
EC	6	Identify the ways that the level of customer satisfaction may affect company success.
EC	7	Explain the importance of a business reputation.
EC	8	Identify possible actions that may be used to correct customer dissatisfaction.
EC	9	Identify the effect of quality on profit.
EC	10	Identify the effects of continuous quality improvement.
EC	11	Demonstrate the use of basic computer skills (Work, Excel, PowerPoint, etc).
ED		DEMONSTRATE EFFECTIVE COMMUNICATION, TEAMWORK AND PROBLEM SOLVING SKILLS
ED	1	Organize materials with a logical flow.
ED	2	Interpret and clarify directions prepared by others.
ED	3	Communicate with customers.

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ED	4	Write steps of an occupational process using sentences and statements as appropriate.
ED	5	Identify appropriate communication methods.
ED	6	Identify components of group dynamics.
ED	7	Demonstrate productive relationships through interaction and networking .
ED	8	Explain the value of applying a problem-solving system.
ED	9	Identify opportunities for applying problem solving techniques.
ED	10	Apply a system of problem solving.
OA		BS.01.01. Distinguish major innovators, historical developments and potential applications of biotechnology in agriculture.
OA	1	BS.01.01.01.a. Define biotechnology and explore the historical impact it has had on agriculture.
OA	2	BS.01.01.01.b. Create a timeline and use it to explain the developmental progression of biotechnology.
OA	3	BS.01.01.01.c. Research and report on the major innovators and milestones in the development of biotechnology.
OA	4	BS.01.01.02.a. Investigate current applications of biotechnology in agriculture.
OA	5	BS.01.01.02.b. Research and report on current work being done in agricultural biotechnology.
OA	6	BS.01.01.02.c. Analyze the scope and impact of agricultural biotechnology in today's global society and economy.
OA	7	BS.01.01.03.a. Examine potential future applications of biotechnology in agriculture and compare them with alternative approaches to improving agriculture.
OA	8	BS.01.01.03.b. Research and report on emerging problems and issues associated with agricultural biotechnology.
OA	9	BS.01.01.03.c. Assess the future impact agricultural biotechnology could have on world populations.
OB		BS.01.02. Determine regulatory issues and identify agencies associated with biotechnology.
OB	1	BS.01.02.01.a. Describe the role of agencies that regulate biotechnology.
OB	2	BS.01.02.01.b. Interpret the major regulatory issues related to biotechnology.
OB	3	BS.01.02.01.c. Research, evaluate and articulate a major regulatory issue pertaining to biotechnology.
OC		BS.01.03. Analyze the ethical, legal, social, political and cultural issues relating to biotechnology.
OC	1	BS.01.03.01.a. Explore ethical, legal and social biotechnology issues.
OC	2	BS.01.03.01.b. Evaluate the benefits and risks associated with biotechnology.
OC	3	BS.01.03.01.c. Research, evaluate and articulate the implications of an ethical, legal, social or cultural biotechnology issue.
OC	4	BS.01.03.02.a. Explore the emergence, evolution and implications of bioethics.
OC	5	BS.01.03.02.b. Examine an ethical dilemma associated with biotechnology by identifying its components.
OC	6	BS.01.03.02.c. Research and debate an ethical issue associated with biotechnology.
OC	7	BS.01.03.03.a. Explain the meaning of intellectual properties as related to biotechnology.

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OC	8	BS.01.03.03.b. Examine intellectual properties associated with biotechnology by defining their components.
OC	9	BS.01.03.03.c. Analyze an intellectual property issue associated with bioethics.
OC	10	Describe how agribiotechnology impacts the global economy.
OC	11	Compare conventional fossil fuel production to biotechnological alternative fuel production (ethanol, biodiesel)
OD		BS.02.01. Maintain and interpret biotechnology laboratory records.
OD	1	BS.02.01.01.a. Maintain a biotechnology laboratory notebook.
OD	2	BS.02.01.01.b. Analyze strengths of the research based on data and procedures, and propose future investigation.
OD	3	BS.02.01.01.c. Utilize external reviews and compare them to research conducted.
OE		BS.02.02. Operate biotechnology laboratory equipment according to standard procedures.
OE	1	BS.02.02.01.a. Operate basic laboratory equipment and measurement devices. (microscope, microipet, autoclave, centrifuge, etc.)
OE	2	BS.02.02.01.b. Operate advanced laboratory equipment and measurement devices. (thermalcycler, electrophoresis equipment, microarray, spectrometer, etc.)
OE	3	BS.02.02.01.c. Calibrate laboratory equipment and conduct instrument qualification tests.
OF		BS.02.03. Demonstrate proper laboratory procedures using biological materials.
OF	1	BS.02.03.01.a. Demonstrate basic aseptic techniques in the biotechnology laboratory.
OF	2	BS.02.03.01.b. Demonstrate advanced aseptic techniques in the biotechnology laboratory.
OF	3	BS.02.03.01.c. Perform bioassays and experiments under aseptic conditions.
OF	4	BS.02.03.02.a. Perform procedures with biological materials according to directions.
OF	5	BS.02.03.02.b. Select an appropriate standard operating procedure for working with biological materials.
OF	6	BS.02.03.02.c. Develop a standard operating procedure for a biological process.
OG		BS.02.04. Safely manage biological materials, chemicals and wastes used in the laboratory.
OG	1	BS.02.04.01.a. Prepare simple chemical solutions using standard operating procedures.
OG	2	BS.02.04.01.b. Prepare buffers, reagents, solutions and media.
OG	3	BS.02.04.01.c. Verify the physical properties of buffers, reagents, solutions and media.
OG	4	BS.02.04.02.a. Identify and describe hazards associated with biological and chemical materials.
OG	5	BS.02.04.02.b. Identify the process to inventory biological and chemical materials, and maintain accurate records of supplies and expiration dates.
OG	6	BS.02.04.02.c. List the procedures to order, stock and maintain supplies of biological and chemical materials.
OG	7	BS.02.04.03.a. Maintain a safe environment by properly identifying and disposing of laboratory waste.
OG	8	BS.02.04.03.b. Diagram the flow of waste after it leaves the laboratory.
OG	9	BS.02.04.03.c. Devise a management plan to reduce laboratory waste.
OH		BS.02.05. Perform microbiology, molecular biology, enzymology and immunology procedures.

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OH	1	BS.02.05.01.a. Differentiate the types of organisms and demonstrate how to handle them safely.
OH	2	BS.02.05.01.b. Isolate, maintain, quantify and store cell cultures.
OH	3	BS.02.05.01.c. Characterize the physical, chemical and biological properties of microbes.
OH	4	BS.02.05.02.a. Explain the structures of DNA and RNA and how genotype influences phenotype.
OH	5	BS.02.05.02.b. Explain the molecular basis for heredity and the tools and techniques used in DNA and RNA manipulations.
OH	6	BS.02.05.02.c. Analyze factors that influence gene expression.
OH	7	BS.02.05.03.a. Extract and purify DNA and RNA.
OH	8	BS.02.05.03.b. Perform electrophoretic techniques and interpret electrophoresis fragmentation patterns.
OH	9	BS.02.05.03.c. Perform DNA and RNA recombinations such as basic cloning/subcloning, blotting, sequencing and amplification.
OH	10	BS.02.05.04.a. Perform simple enzyme activity assays to detect proteins.
OH	11	BS.02.05.04.b. Perform protein separation techniques and interpret the results.
OH	12	BS.02.05.04.c. Characterize the biochemical properties of proteins.
OH	13	BS.02.05.05.a. Describe how antibodies are formed and how they can be used in biotechnology applications.
OH	14	BS.02.05.05.b. Conduct an Enzyme-Linked Immunosorbent Assay (ELISA).
OH	15	BS.02.05.05.c. Use antibodies to detect and quantify antigens.
OH	16	BS.02.05.06.a. Explain reasons for detecting microbes and identify sources of microbes.
OH	17	BS.02.05.06.b. Research and describe the use of biotechnology to detect microbes.
OH	18	BS.02.05.06.c. Design and perform an assay to detect a target microorganism in food, water or the environment.
OI		BS.03.01. Evaluate the application of genetic engineering to improve products of AFNR systems.
OI	1	BS.03.01.01.a. Explain biological, social, agronomic and economic reasons for genetic modification of eukaryotes.
OI	2	BS.03.01.01.b. Diagram the processes and describe the techniques used to produce transgenic eukaryotes.
OI	3	BS.03.01.01.c. Design and conduct an experiment to evaluate an existing transgenic eukaryote.
OI	4	BS.03.01.02.a. Describe enzymes, the changes they cause in foods and the physical and chemical parameters that affect enzymatic reactions.
OI	5	BS.03.01.02.b. Describe processes by which enzymes are produced through biotechnology.
OI	6	BS.03.01.02.c. Use biotechnology tools or microbial strain selection to improve or discover enzymes for use in food processing.
OI	7	BS.03.01.03.a. Compare and contrast the use of natural organisms and genetically engineered organisms in the treatment of wastes.
OI	8	BS.03.01.03.b. Diagram the process by which organisms are genetically engineered for waste treatment.
OI	9	BS.03.01.03.c. Monitor and evaluate the treatment of a waste product using a genetically engineered organism.

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OI	10	BS.03.01.04.a. Describe the benefits and risks associated with the use of biotechnology to increase productivity and improve quality of aquatic species.
OI	11	BS.03.01.04.b. Investigate and report on genetic engineering procedures used in the production of aquatic species.
OI	12	BS.03.01.04.c. Conduct field or clinical trials for genetically modified aquatic species.
OJ		BS.03.02. Perform biotechnology processes used in AFNR system
OJ	1	BS.03.02.01.a. Explain the functions of hormones in animals.
OJ	2	BS.03.02.01.b. Describe the processes used to produce animal hormones from transgenic organisms.
OJ	3	BS.03.02.01.c. Administer hormones to enhance animal health, growth or reproduction, and monitor and analyze the results.
OJ	4	BS.03.02.02.a. Identify foods produced through fermentation.
OJ	5	BS.03.02.02.b. Compare and contrast bioengineering and conventional pathways used in food processing.
OJ	6	BS.03.02.02.c. Process food using biotechnology.
OJ	7	BS.03.02.03.a. Explain the process of fermentation.
OJ	8	BS.03.02.03.b. Describe the process used in producing alcohol from biomass.
OJ	9	BS.03.02.03.c. Produce alcohol and co-products from biomass.
OJ	10	BS.03.02.04.a. Explain the process of transesterification.
OJ	11	BS.03.02.04.b. Diagram the process used in producing biodiesel from biomass.
OJ	12	BS.03.02.04.c. Produce biodiesel and co-products from biomass.
OJ	13	BS.03.02.05.a. Explain the process of methanogenesis.
OJ	14	BS.03.02.05.b. Illustrate the process used in producing methane from biomass.
OJ	15	BS.03.02.05.c. Produce methane and co-products from biomass.
OK		BS.03.03. Use biotechnology to monitor and evaluate procedures performed in AFNR systems.
OK	1	BS.03.03.01.a. Describe the selective plant breeding process.
OK	2	BS.03.03.01.b. Select biotechnology tools used to monitor and direct plant breeding.
OK	3	BS.03.03.01.c. Design and conduct an experiment using biotechnology tools to evaluate selectively bred plants.
OK	4	BS.03.03.02.a. Describe biotechnology processes applicable to animal health.
OK	5	BS.03.03.02.b. Assess the benefits, risks and opportunities associated with using biotechnology to promote animal health.
OK	6	BS.03.03.02.c. Implement animal-care protocols that use biotechnology tools to ethically monitor and promote animal systems. (Institutional Animal Care and Use Committee develops animal-care protocols)
OK	7	BS.03.03.03.a. Give examples of instances in which bioremediation can be applied to clean up environmental contaminants.
OK	8	BS.03.03.03.b. Describe the use of biotechnology in bioremediation.
OK	9	BS.03.03.03.c. Monitor and evaluate the effectiveness of bioremediation efforts by participating in a bioremediation project.
OK	10	BS.03.03.04.a. Explain the use of microorganisms in biological waste management.
OK	11	BS.03.03.04.b. Describe the processes involved in biotreatment of biological wastes.

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OK	12	BS.03.03.04.c. Monitor and evaluate the treatment of biological wastes with microorganisms.
OK	13	BS.03.03.05.a. Explain the role of microorganisms in industrial chemical waste treatment.
OK	14	BS.03.03.05.b. Interpret the processes involved in biotreatment of industrial chemical wastes.
OK	15	BS.03.03.05.c. Monitor and evaluate the treatment of industrial chemical wastes with microorganisms.
OK	16	BS.03.03.06.a. Explain the global importance of biodiversity.
OK	17	BS.03.03.06.b. Select biotechnology tools used to measure biodiversity.
OK	18	BS.03.03.06.c. Use biotechnology tools to measure biodiversity in a population.
OK	19	BS.03.03.07.a. Explain the consequences of agricultural practices on wild populations.
OK	20	BS.03.03.07.b. Explain how biotechnology tools can be used to monitor the effects of agricultural practices on wild populations.
OK	21	BS.03.03.07.c. Analyze the implications of biotechnology on wild species.
OK	22	BS.03.03.08.a. Explain biomass and sources of biomass.
OK	23	BS.03.03.08.b. Assess the characteristics of biomass that make it useful for biofuels production.
OK	24	BS.03.03.08.c. Evaluate the technologies used to create biofuels from biomass.
OK	25	BS.03.03.09.a. Define industrial biotechnology, and describe the benefits and risks associated with its use in the manufacturing of fabrics, plastics and other products.
OK	26	BS.03.03.09.b. Describe the processes used in the production of molecules for use in industrial applications.
OK	27	BS.03.03.09.c. Monitor and evaluate biotechnology processes used in the synthesis of a molecule.