Agriculture, Food, and Natural Resources 6-12 Educator Standards

FINAL

May 2, 2014

Agriculture, Food, and Natural Resources Educator Standards

Standard I. The agriculture, food, and natural resources (AFNR) teacher understands the scope of agriculture and the foundations of agricultural education and applies the process of scientific discovery to the various disciplines of agriculture.

Standard II. The agriculture, food, and natural resources (AFNR) teacher promotes student development through effective use of career pathways, supervised agricultural experiences, leadership development, and student organizations (e.g., FFA).

Standard III. The agriculture, food, and natural resources (AFNR) teacher understands and applies principles of economics and business management in AFNR enterprises.

Standard IV. The agriculture, food, and natural resources (AFNR) teacher understands plant and soil science and applies principles and methods used in plant production and management.

Standard V. The agriculture, food, and natural resources (AFNR) teacher understands animal science and animal food processing and applies principles and methods used in animal care, production, and management.

Standard VI. The agriculture, food, and natural resources (AFNR) teacher understands and applies principles and methods of AFNR power, structural, and mechanical systems and related technologies.

Standard VII. The agriculture, food, and natural resources (AFNR) teacher has a basic understanding of emerging technologies and understands the use of information technologies in the AFNR industries.

Standard VIII. The agriculture, food, and natural resources (AFNR) teacher understands and applies knowledge of environmental systems, natural resource management, and the effects of agriculture, energy, and food processing on the environment.

Standard IX. The agriculture, food, and natural resources (AFNR) teacher knows how to organize and manage an effective agriculture, food, and natural resources program and how to work with school, community, and industry representatives to support the program.

Standard X. The agriculture, food, and natural resources (AFNR) teacher knows how to plan, implement, and utilize instruction and student assessment, including academic integration.

Standard XI. The agriculture, food, and natural resources (AFNR) teacher understands and applies appropriate safety and risk management procedures and practices to ensure the safety and well-being of all students in the classroom, laboratory, field, and supervised agricultural experience (SAE).

Standard I. The agriculture, food, and natural resources (AFNR) teacher understands the scope of agriculture and the foundations of AFNR education and applies the process of scientific discovery to the various disciplines of agriculture.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands	The beginning teacher is able to
1.1k the philosophy and goals of AFNR education;	1.1s discuss the impact and contributions of agriculture, food, and natural resources to the economy and society on a local, state, national, and international level;
1.2k the scope of agriculture and its effects on society (e.g., the impact of mechanization on world agriculture);	1.2s describe major areas of AFNR, including research and development;
1.3k significant historical events and current developments in agriculture, the food industry, and natural resource utilization;	1.3s connect relevant laws and policies, including government regulations and codes, with areas of the AFNR industries and evaluate the significance to the industries;
1.4k the contribution of technology advances to AFNR processes and practices;	1.4s analyze the impact of current and developing technologies on the AFNR industries and society;
1.5k ethical and legal issues related to AFNR education (e.g., ethical treatment of animals, liability for accidental injury);	1.5s design and conduct scientific investigations, including experimental and non-experimental designs;
1.6k concepts and terms used in agriculture and AFNR education;	1.6s use a variety of tools and techniques to access, gather, store, retrieve, organize, and analyze data;
1.7k scientific principles and methods and the scientific process as it relates to AFNR;	1.7s solve problems using mathematics principles;
1.8k characteristics of various types of scientific investigations (e.g., descriptive, experimental, comparative);	1.8s analyze, evaluate, make inferences, and predict trends from data; and
1.9k application of mathematics to AFNR subjects;	1.9s design and create unique products in various disciplines of agriculture.
1.10k principles and procedures for designing and conducting scientific investigations (including formulating hypotheses, collecting data, analyzing data, communicating findings and results, drawing conclusions and inferences); and	
1.11k elements of creativity and design.	

Standard II. The agriculture, food, and natural resources (AFNR) teacher promotes student development through effective use of career pathways, supervised agricultural experiences, leadership development, and student organizations (e.g., FFA).

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands	The beginning teacher is able to
2.1k sources of information and research related to agriculture and AFNR education, careers, and industry certifications and licensures;	2.1s demonstrate strategies for career planning and development, including resources and information;
2.2k career development and entrepreneurship opportunities in the field of agriculture/agribusiness and related fields;	2.2s develop skills (e.g., interpersonal, ethical) to meet career expectations;
2.3k the characteristics of a successful worker in modern agriculture and related fields and the knowledge and skills necessary for various careers in AFNR;	2.3s coordinate supervised agricultural experience (SAE);
2.4k employers' expectations, appropriate work habits, and good citizenship skills relevant to AFNR employment;	2.4s assist students in planning, implementing, and managing their SAE;
2.5k procedures for applying for, obtaining, and maintaining employment in agriculture and related fields;	2.5s apply procedures for maintaining accurate records, assessing student progress, and evaluating the effectiveness of SAE;
2.6k goals and purposes of supervised agricultural experience (SAE) and relationships among the agricultural classroom, lab, field, and SAE;	2.6s apply strategies for encouraging student participation in student leadership-development organizations;
2.7k legal and ethical issues related to SAE (e.g., child labor laws, validation issues);	2.7s advise and develop a basic program of activities for a student leadership-development organization (e.g., FFA);
2.8k characteristics of various types of SAE (e.g., cooperative education, entrepreneurship, mentoring);	2.8s apply democratic principles to conduct effective meetings of a student leadership-development organization (e.g., FFA, 4-H);
2.9k characteristics, functions, and organizational structure of student leadership-development organizations (e.g., FFA, 4-H);	2.9s plan, organize, and conduct career-development events (CDEs) and leadership-development events (LDEs);
2.10k roles and responsibilities of advisors to student leadership-development organizations;	2.10s model leadership characteristics and processes and development of interpersonal relationships; and
2.11k parliamentary procedure and strategies for conducting effective meetings of a student leadership-development organization;	2.11s utilize effective communication skills in AFNR enterprises (verbal, written, electronic, technology, and media).
2.12k concepts and characteristics of leadership and interpersonal skills development; and	
2.13k elements of communication, including accuracy, relevance, rhetorical features, and organization of information.	

Standard III. The agriculture, food, and natural resources (AFNR) teacher understands and applies principles of economics and business management in AFNR enterprises.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands 3.1k key economic principles (e.g., risk, supply and demand, marketing, value added) in AFNR businesses; 3.2k related agencies (local, state, and federal) and major laws and regulations affecting AFNR entities (including property rights, land ownership); 3.3k the role of entrepreneurship in AFNR; 3.4k traits, skills, and characteristics of successful agriculturalists and other related entrepreneurs (producers, managers, business owners, leaders); 3.5k basic organizational structures in AFNR businesses; 3.6k the impact of diversity in the workplace on the AFNR industries; 3.7k basic principles and methods of keeping records in AFNR activities (e.g., budgeting, obtaining credit, financial management); 3.8k global trends in food and fiber production, inspection, processing, distribution, and demand; and 3.9k factors that influence the marketing of AFNR goods and services.	The beginning teacher is able to 3.1s appraise the influence of key economic principles in AFNR business; 3.2s demonstrate work-related and business-related ethics; 3.3s evaluate the influence of related agencies and organizations on the AFNR industries; 3.4s appraise the value of AFNR businesses (including net worth, capital resources, credit, liability); 3.5s identify the impact of economic principles and government policies and regulations and how they relate to business-related decision making; 3.6s describe types and characteristics of budgets used in AFNR businesses; 3.7s demonstrate record-keeping skills and procedures; 3.8s develop record-keeping systems with appropriate computer hardware and software applications (e.g., spreadsheet, database, communications) for AFNR activities; 3.9s apply strategies for managing a culturally diverse workforce and for ensuring respect for diversity in the workplace; 3.10s recognize the relationship between world markets and U.S. and Texas AFNR enterprises; and 3.11s analyze factors that influence consumer behavior (e.g., socioeconomic status, culture, age, gender).

Standard IV. The agriculture, food, and natural resources (AFNR) teacher understands plant and soil science and applies principles and methods used in plant production and management.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands	The beginning teacher is able to
4.1k the nature and properties of soil, processes of soil formation, and the importance of various soil constituents for plant growth;	4.1s identify the components of soil, describe the physical and chemical properties of soils, and classify different types of soil;
4.2k methods and procedures for improving the quality of soil (e.g., adding fertilizers, lime, and organic matter; mulching);	4.2s apply procedures for performing and interpreting basic soil tests (e.g., nutrient, organic content, pH) and for evaluating the suitability of different types of soil for production of various crops;
4.3k the importance of conserving soil, methods of soil conservation, and practices that reduce soil erosion (e.g., strip planting, contour plowing);	4.3s determine different types and formulations of fertilizers and other soil treatments;
4.4k characteristics, advantages, and disadvantages of various methods of tillage and seedbed preparation;	4.4s classify plants and identify distinguishing features of major plant groups (e.g., monocots and dicots);
4.5k the structure and function of plant parts (e.g., flowers, leaves, roots, stems);	4.5s explain principles, methods, and techniques of selective breeding and hybridization of plants;
4.6k physiological processes in plants (e.g., photosynthesis, respiration, transpiration, transport);	4.6s demonstrate techniques for propagating plants sexually (e.g., pollination, seed collection, germination) and asexually (e.g., cell cultures, budding, division, gene insertion);
4.7k processes of plant reproduction and principles of plant genetics;	4.7s identify types, varieties, characteristics, and uses of agriculturally important plants grown in Texas and the United States;
4.8k traditional and contemporary principles and methods used in the sexual and asexual propagation of plants;	4.8s evaluate methods and techniques used for crop production and management (e.g., selecting, planting, irrigating, fertilizing, pruning, harvesting, storing) and for propagating, transplanting, growing, and maintaining greenhouse and nursery plants;
4.9k the effects of various environmental factors (e.g., soil characteristics, light intensity, day length, temperature) on plant growth and development;	4.9s describe common nutrient deficiencies, diseases, weeds, and insect pests that affect both the short-term and long-term production of crops;
4.10k principles of plant production and management and their relationship to environmental stewardship (e.g., soil preparation, water management, crop rotation, sustainability considerations);	4.10s describe integrated pest management and the safe handling of pest management materials;
4.11k principles and methods of disease, insect, and weed control (e.g., integrated pest management, chemical control, biological control);	4.11s apply procedures for planning, establishing, and maintaining landscapes;
4.12k basic methods for managing the greenhouse and nursery environment (e.g., controlling temperature, lighting, humidity);	*(continued)*
4.13k basic principles of landscape and turf grass design and management;	

***Standard IV*.** The agriculture, food, and natural resources (AFNR) teacher understands plant and soil science and applies principles and methods used in plant production and management.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12)***
4.14k basic principles of floral design, including design principles and the preparation, handling, and storage of flowers; 4.15k basic principles of identifying and processing and preserving edible plant products, including relevant laws and regulations; and 4.16k basic principles of forestry and silviculture.	4.12s apply basic procedures for planning and creating floral designs; 4.13s evaluate regulations and procedures for grading, packing, storing, and marketing edible plant products (e.g., fruits, nuts, and vegetables); 4.14s explain basic scientific concepts associated with physiological processes (e.g. photosynthesis, respiration) in plants; and 4.15s demonstrate basic skills and procedures related to forestry and silviculture.

Standard V. The agriculture, food, and natural resources (AFNR) teacher understands animal science and animal food processing and applies principles and methods used in animal care, production, and management.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands	The beginning teacher is able to
5.1k the characteristics and uses of various species, breeds, and types of animals of major economic importance in the United States;	5.1s analyze trends in the consumption of animal products (e.g., meat, poultry, fish, eggs, dairy products) in Texas and the United States and health issues related to the consumption of animal products;
5.2k the anatomy of major organs and organ systems (e.g., respiratory, digestive, skeletal, muscular) in various animals (e.g., cattle, horses, swine, poultry);	5.2s recognize the contributions of various species, breeds, and types of animals to the economy and to society;
5.3k physiological processes (e.g., digestion, respiration, circulation) in various animals;	5.3s describe the anatomy and physiology of various species, breeds, and types of animals of economic importance in the United States;
5.4k basic principles of cell biology;	5.4s explain basic scientific concepts associated with physiological processes (e.g., digestion, respiration, circulation) in various animals;
5.5k stages and processes of growth and development in various animals;	5.5s describe basic components and processes associated with cellular biology;
5.6k basic nutritional requirements of animals;	5.6s explain animal nutrition (e.g., sources of nutrients, classes of feeds, feed additives) and feeding practices (e.g., formulating rations, issues of feed quality, feeding schedules);
5.7k basic principles of animal reproduction and selective breeding;	5.7s apply principles of genetics (e.g., EPDs, progeny data, trait selection) to selective breeding of animals;
5.8k guidelines for making decisions about purchasing, selling, and culling individual animals;	5.8s differentiate natural and artificial animal breeding practices (e.g., controlling mating, artificial insemination) and current technologies used in animal reproduction (e.g., embryo transfer);
5.9k common nutrient deficiencies, diseases, insect pests, and genetic disorders of animals and methods of disease control, treatment, and prevention;	5.9s evaluate varieties of animals (for multiple purposes including breeding and market) using various data (e.g., performance testing, production records, progeny testing, visual appraisal);
5.10k the care and safe handling of animals throughout the life cycle and legal and ethical aspects of animal care and well-being;	5.10s identify signs, symptoms, and effects of common animal diseases, disorders, parasites, and nutritional deficiencies;
5.11k normal and abnormal behavior in various animals and its relationship to animal management;	5.11s differentiate between the processes and impacts of animal disease and parasites on animal health;
5.12k medical terminology used in care and treatment of various animals;	5.12s explain animal management procedures (e.g., immunizing, taking vital signs, restraining, medicating, common surgical procedures);
5.13k vital signs and measures used to diagnose health issues in various animals;	
5.14k different types, characteristics, and purposes of animal facilities (e.g., barns, feedlots);	
(continued)	*(continued)*

Standard V. The agriculture, food, and natural resources (AFNR) teacher understands animal science and animal food processing and applies principles and methods used in animal care, production, and management.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
5.15k appropriate environmental conditions (e.g., lighting, temperature, humidity) for housing various animals and methods of environmental control; 5.16k environmental issues associated with animal facilities and basic procedures for managing animal waste and maintaining sanitation; 5.17k basic principles of livestock harvesting, including the preparation and grading of carcasses, and factors that affect palatability; 5.18k basic principles of processing, grading, and preserving edible animal products (e.g., meat, poultry, fish, eggs, dairy products), including safe handling and relevant laws and regulations; and 5.19k processes and procedures for the safe handling and quality control of food through harvesting, processing, and preservation.	5.13s interpret appropriate environmental conditions (e.g., bedding, space, sanitation) for various types of animal facilities; 5.14s analyze factors affecting meat palatability, identify differences between wholesale and retail cuts of meat, and describe meat processing techniques; 5.15s explain basic methods for processing milk and dairy products; 5.16s describe basic sanitation procedures for safe handling, processing, and packaging edible animal products (including HACCP); 5.17s identify basic U.S. Department of Agriculture (USDA) regulations and procedures for inspecting, grading, packaging, and labeling edible animal products; and 5.18s describe the legal aspects of animal welfare, animal rights, and humane treatment for companion animals, and appropriate considerations for veterinary ethics.

Standard VI. The agriculture, food, and natural resources (AFNR) teacher understands and applies principles and methods of AFNR power, structural, and mechanical systems and related technologies.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands	The beginning teacher is able to
6.1k safety regulations, policies, and basic procedures related to AFNR power, structural, and mechanical systems and related technologies;	6.1s identify and use personal safety equipment and identify hazards and safety needs in the home and workplace;
6.2k basic terms and principles related to simple machines, force, work, power, and electronics (e.g., volts, watts, amperes) as they apply to AFNR;	6.2s identify and select common tools, machinery, and equipment used in AFNR and demonstrate knowledge of techniques for their proper inspection, maintenance, and storage;
6.3k basic principles of selection and use of hand and power tools, machines, and equipment required for AFNR construction, fabrication, maintenance, and repair;	6.3s demonstrate the safe and proper operation of tools, machinery, and equipment used in AFNR;
6.4k the design, components, and basic principles of operation of internal combustion engines and related power systems used in AFNR;	6.4s service, troubleshoot, and maintain internal combustion engines, machinery and power equipment, and related systems (e.g., brake, hydraulic, cooling, lubricating, electronic);
6.5k the design, components, and basic principles of operation of electric circuits, motors, sensors, and control devices;	6.5s demonstrate basic wiring procedures used in AFNR;
6.6k basic principles and techniques for cutting, shaping, and joining metal for AFNR applications;	6.6s identify commonly used metals, their properties, and their uses and safely perform basic metalworking procedures (e.g., cutting, filing, shaping, drilling, soldering, welding) in AFNR;
6.7k basic principles and techniques for planning and constructing structures and enclosures for AFNR;	6.7s apply basic procedures for planning construction of structures and enclosures (e.g., locating sites, drawing plans, estimating materials and costs) for AFNR;
6.8k the role of agricultural and rural water-supply and sanitation systems;	6.8s apply basic construction skills (e.g., carpentry, masonry, painting) used to build structures and enclosures for AFNR; and
6.9k basic principles of heating, ventilation, and cooling systems; and	6.9s use basic plumbing methods, tools, and materials.
6.10k basic principles and techniques of land measurement, leveling, and irrigation systems.	

***Standard VII*.** The agriculture, food, and natural resources (AFNR) teacher has a basic understanding of emerging technologies and understands the use of information technologies in the AFNR industries.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands	The beginning teacher is able to
7.1k basic applications of biotechnology in AFRN (e.g., cold tolerance, herbicide resistance in plants);	7.1s predict changes in AFNR industries resulting from advancements in biotechnology;
7.2k basic principles of tissue culture and genetic engineering;	7.2s demonstrate basic laboratory techniques used in biotechnology;
7.3k social, economic, environmental, ethical, and legal issues in biotechnology;	7.3s apply basic principles of DNA fingerprinting to genome mapping and marker-assisted selection and identification of crops and livestock;
7.4k the use of technology in scientific research;	7.4s use emerging technologies to exchange and gather information;
7.5k the use of technological systems in AFNR record keeping (e.g., milk production records, breeding records, nutrient management);	7.5s access and use digital information databases (e.g., Dairy Herd Improvement Association database, pedigree records, production records, Internet resources);
7.6k the use of technological systems in crop production and management (e.g., the Global Positioning System [GPS], geographic information systems [GIS]);	7.6s apply appropriate technologies to crop production and management (e.g., measure crop yields, automatically monitor and control humidity in greenhouses and irrigation systems);
7.7k basic computer applications used in AFNR;	7.7s apply appropriate technologies to animal production and management (e.g., monitor production of milk and eggs, identify individual animals using chip implants, monitor and control temperature in barns, formulate livestock rations);
7.8k the nature of information available through electronic outlets; and	7.8s use appropriate computer hardware and software applications (e.g., spreadsheet, database, presentation, communications) for AFNR-related tasks; and
7.9k legal and ethical issues associated with the use of online information (including copyright, trademarks, intellectual property, plagiarism).	7.9s model ethical and legal acquisition of digital information.

Standard VIII. The agriculture, food, and natural resources (AFNR) teacher understands and applies knowledge of environmental systems, natural resource management, and the effects of agriculture, energy, and food processing on the environment.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands 8.1k basic ecological principles and concepts (e.g., habitat, carrying capacity, ecological succession); 8.2k laws, regulations, and ethical issues relating to the use and management of the environment and natural resource systems (e.g., landowner property rights, stewardship, energy and minerals exploration and extraction, sustainability); 8.3k roles and responsibilities of government agencies, private companies, and public service organizations in relation to environmental conservation and management (e.g., underground water districts, Natural Resource Conservation Service [NRCS], boards of conservation, energy exploration and production, utility construction); 8.4k factors affecting the availability of natural resources and the effects of resource availability on agriculture, food production and processing, and natural resources conservation and management; 8.5k the interdependence of agriculture, food production and processing, and natural resources conservation and management and the environment; 8.6k the impacts of agriculture, food production and processing, and resources conservation and management on land, air, mineral, energy, and water resources and quality; 8.7k basic principles and methods related to land, water, mineral, energy, and air management and conservation and the sustainable use of resources; 8.8k characteristics and management of agricultural ecosystems (e.g., cultivated land, rangeland, forest land, wetlands); 8.9k basic principles and methods of natural-environment recreation management (e.g., forest, fish, wildlife); and 8.10k basic principles and procedures for aquaculture production systems.	The beginning teacher is able to 8.1s explain environmental systems and cycles; 8.2s differentiate various types of renewable and nonrenewable natural resources (e.g., energy, land, water) and their effects on the agricultural economy; 8.3s explain methods of conservation (e.g., energy efficiency, use of alternative fuels, recycling, runoff control, erosion control); 8.4s develop basic environmental management plans (e.g., air, land, water); 8.5s analyze the importance of habitat conservation; 8.6s identify agricultural sources of pollution and analyze costs and benefits of reducing pollution; 8.7s identify causes of soil erosion and analyze costs and benefits of reversing environmental degradation; 8.8s recognize the impact of laws, regulations, and ethical issues (e.g., landowner property rights, stewardship, energy and minerals exploration and extraction, sustainability) on management decisions in AFNR; 8.9s differentiate between freshwater and saltwater aquacrops, game fish, management systems, and other aspects of the aquaculture industry; and 8.10s develop and manage recirculating systems and other scenarios for aquaculture production.

Standard IX. The agriculture, food, and natural resources (AFNR) teacher knows how to organize and manage an effective AFNR program and how to work with school, community, and industry representatives to support the program.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands	The beginning teacher is able to
9.1k roles and responsibilities of the AFNR teacher (e.g., program coordinator, advisor);	9.1s plan a sequence of courses for an AFNR education program (e.g., exploratory, technical, comprehensive, specialized);
9.2k methods and strategies for planning, implementing, and maintaining an AFNR program;	9.2s identify curriculum needs and apply performance standards in meeting those needs;
9.3k the importance of basing classroom instruction on business and industry standards and real-world practices;	9.3s collaborate with education, community, and industry partners (e.g., other faculty, advisory committees) to design AFNR instruction that integrates knowledge and skills from core academic subjects;
9.4k strategies for establishing partnerships with individuals, groups, and organizations (e.g., teachers, businesses, community groups, postsecondary institutions);	9.4s apply feedback from a variety of sources (e.g., internal reviews, advisory committees) to evaluate the quality and effectiveness of the AFNR program and use assessments to establish program improvement goals;
9.5k roles and responsibilities of community, industry organizations, and advisory committees (e.g., evaluating the AFNR program, ensuring that the curriculum meets industry standards, supporting youth organizations);	9.5s document the ability of the AFNR program to meet goals;
9.6k the importance of various professional organizations (e.g., FFA, ACTE, NAAE) for professional growth and development; and	9.6s organize and work effectively with advisory committees and ensure the equitable representation of all stakeholders (e.g., special programs staff, community members, parents/guardians, business representatives) on advisory committees;
9.7k types and characteristics of professional development activities (e.g., conferences, graduate work) to ensure lifelong learning in AFNR education.	9.7s develop articulation agreements with education and training partners;
	9.8s work effectively with community and industry representatives and local and civic organizations to encourage involvement in and support for the AFNR program; and
	9.9s use marketing strategies to promote the AFNR education program and recruit students into the program.

Standard X. The agriculture, food, and natural resources (AFNR) teacher knows how to plan, implement, and utilize instruction and student assessment, including academic integration.

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands 10.1k state content and performance standards in AFNR education, as defined by the Texas Essential Knowledge and Skills (TEKS); 10.2k instructional strategies and activities that engage students, provide positive and effective learning experiences, and model real-world practices (e.g., group brainstorming, conducting research, making presentations, engaging in teamwork, exhibiting leadership); 10.3k instructional strategies for working effectively with students who have diverse strengths, needs, and backgrounds; 10.4k instructional techniques that foster the development of analytical thought, critical thinking, and problem solving skills; 10.5k the importance of integrating AFNR education with concepts and skills in academic areas, including language arts, mathematics, science, and social studies; 10.6k strategies for using current and emerging technologies as tools for learning and communicating AFNR education concepts; 10.7k strategies and techniques for communicating effectively in the classroom; and 10.8k a variety of assessment instruments and methods, including performance-based methods, for evaluating instructional effectiveness and determining students' progress and needs.	The beginning teacher is able to 10.1s use personal AFNR experience and skills to enhance student learning in the classroom; 10.2s select and use effective instructional practices, strategies, activities, technologies, and materials to promote students' knowledge, skills, and progress in AFNR education; 10.3s use multiple forms of assessment to evaluate instructional effectiveness, determine students' progress and needs, and plan instruction; 10.4s assist students in developing and evaluating career objectives; 10.5s use strategies to keep abreast of and apply current research, trends, and practices in AFNR education; and 10.6s identify AFNR industry sources for learning about emerging trends and practices.

Standard XI. The agriculture, food, and natural resources (AFNR) teacher understands and applies appropriate safety and risk management procedures and practices to ensure the safety and well-being of all students in the classroom, laboratory, field, and supervised agricultural experience (SAE).

Teacher Knowledge: What Teachers Know ***Teachers of Students in Grades 6–12***	**Application: What Teachers Can Do** ***Teachers of Students in Grades 6–12***
The beginning teacher knows and understands 11.1k risk management issues related to AFNR (e.g., ethical treatment of animals, safe and appropriate student transportation, respect for persons); 11.2k personal and occupational safety and sanitation practices (e.g., HACCP), including basic first aid, used in the agricultural classroom, lab, field, and SAE; 11.3k the proper use, storage, and disposal of hazardous materials (e.g., chemicals, petroleum products, biological waste products) used in the AFNR classroom, lab, field, and SAE; 11.4k sources of safety-related information (e.g., Material Safety Data Sheets, emergency response procedures); and 11.5k federal, state, and local safety regulations and agencies responsible for maintaining safety in the AFNR classroom, lab, field, and SAE.	The beginning teacher is able to 11.1s apply procedures and practices for safely selecting and maintaining equipment, materials, facilities, and technology used in the AFNR classroom, laboratory, field, etc.; 11.2s instruct students in the proper and safe use of materials, tools, and instruments, and monitor students' behavior; 11.3s develop and implement a risk management and safety plan for the AFNR classroom, lab, field, and SAE; 11.4s incorporate risk management and safety training into the AFNR education program; 11.5s identify potential hazards in the AFNR classroom, lab, field, and SAE; and 11.6s apply procedures for responding to accidents, including first aid.