



CTSO Course Alignments: Agriscience

Below you will find standards for the Agriscience course aligned with competitive events from appropriate career and technical student organizations (CTSOs). Knowing the aligned events for your organization will allow you to have additional tools for teaching course standards, as well as increase student engagement and preparation in your CTSO activities. The final column recommends potential tools from other CTSO organizations. Even if your students are not participating in these organizations, available rubrics, tools, and materials can also add to the instructional resources at your disposal for best teaching your content.

Important to note: While the aligned activities below can be important tools in teaching course standards, it is important to note that events may not cover a standard in its entirety and should not be the sole instructional strategy used to address a standard.

	STANDARD	ALIGNED FFA COMPETITIVE EVENTS/PROGRAMS	OTHER POTENTIAL CTSO TOOLS & RESOURCES
1	Synthesize research on the historical importance and purpose of agriculture and agriculture organizations, identifying major events, opportunities and technological developments influenced by agriscience theories and practices. (TN Writing 8)	<ul style="list-style-type: none"> • FFA: Creed and Ceremonies 	<ul style="list-style-type: none"> • FCCLA: Illustrated Talk
2	Identify and review general common laboratory safety procedures including but not limited to prevention and control procedures in agriscience laboratories. Incorporate safety procedures and complete safety test with 100 percent accuracy. (TN Reading 3)		<ul style="list-style-type: none"> • HOSA: Biotechnology • SkillsUSA: Occupational Health & Safety
3	Gather and analyze information from multiple authoritative sources, such as the United States Bureau of Labor Statistics, United States Department of Agriculture website and Tennessee labor data, to summarize the economic impact of the agricultural industry. Describe major career trends in Tennessee, the United States, and worldwide. (TN Writing 8, 9; TN Math S-ID)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Career Investigation • SkillsUSA: Entrepreneurship

4	Determine how a Supervised Agricultural Experience (SAE) program functions as a method to apply concepts of the scientific investigation process (i.e. conducting an Agriscience Fair project). Compare and contrast the types of SAEs as related to their importance to the scientific investigation process. (TN Reading 1, 9; TN Writing 2, 7, 9)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	<ul style="list-style-type: none"> • FBLA: Business Plan • DECA: Community Service Project, Creative Marketing Project, Public Relations Project, Entrepreneurship Innovation Plan, Entrepreneurship Participating, Entrepreneurship Written, Entrepreneurship Growing Your Business • SkillsUSA: Entrepreneurship
5	Conduct a research project or literature review exploring a specific social and/or political impact on the agriculture industry at the local, state, national, or international level. For example, explore how the increase in availability of genetically modified organisms has impacted crop production and the green movement. Summarize findings in an informative essay. Revise, edit or rewrite as needed to strengthen writing. (TN Writing 2, 5, 8, 9)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Advocacy • HOSA: Biomedical Debate, Researched Persuasive Speaking • TSA: Debating Technological Issues
6	Describe the biogeochemical cycles impacting the agriculture industry by creating illustrative models and informative texts for the following: <ul style="list-style-type: none"> a. Carbon cycle b. Nitrogen cycle c. Oxygen cycle d. Water cycle (TN Reading 2; TN Writing 2, 4, 9)	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	<ul style="list-style-type: none"> • FCCLA: Illustrated Talk • TSA: Desktop Publishing
7	Critique the dynamics of biomass and energy flow in ecosystems by analyzing the major components of a food chain. Analyze the structure of the relationships among the concepts of carrying capacity, species populations, and organism interactions within multiple ecosystems and natural habitats. (TN Reading 5; TN Writing 1, 9; TN Biology I 2, 3; TN Biology II 2, 3)	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	
8	Produce an informative essay to distinguish between types of pollution and their sources, defining and applying ecology- and conservation-specific terminology. Compare and contrast important connections between pollution and its effects on environmental conditions (i.e. water, soil and air), animal populations, and plant populations. (TN Reading 4; TN Writing 2, 4, 8, 9; TN Environmental Science 6)	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	<ul style="list-style-type: none"> • FCCLA: Environmental Ambassador • HOSA: Public Health, Extemporaneous Health Poster, Public Service Announcement
9	Compare basic plant and animal cell biology, including structure and function. Create a visual representation that identifies cellular organelles and major cell processes. (TN Reading 2, 7; TN Biology I 1; TN Biology II 1)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	
10	Compare and contrast the roles of proteins, carbohydrates, lipids, and nucleic acids as they relate to cell growth and cell reproduction. (TN Biology I 1; TN Biology II 1)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	

11	Determine the significance of and relationships between genes, chromosomes, proteins, and hereditary traits. Analyze the role of genes in determining genetic make-up, gender, and hereditary characteristics. Using systems of equations, explain the variation and distribution of genotypes and phenotypes expressed in plants and animals. (TN Math A-CED; TN Biology I 4; TN Biology II 4)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	
12	Using graphic illustrations and supporting text, identify and describe major animal body systems (skeletal, muscular, respiratory, digestive, nervous, circulatory, respiratory, and reproductive) to establish a basic knowledge of their purpose, structure, and function. (TN A&P 1, 2, 4, 5, 6)	<ul style="list-style-type: none"> • FFA: Dairy Cattle Management and Evaluation, Horse Evaluation, Livestock Evaluation, Poultry Evaluation, Veterinary Science 	<ul style="list-style-type: none"> • FCCLA: Illustrated Talk • HOSA: Veterinary Science
13	Classify the types of digestive systems in domestic animals, and compare and contrast their anatomical and physiological differences. Synthesize research on animal nutrition (using academic journals or publications from Tennessee Extension Service) to produce an informative narrative, including defining and applying nutrition specific terminology, to examine the stages of digestion and associated processes. (TN Reading 4, 9; TN Writing 2, 4; TN A&P 5)	<ul style="list-style-type: none"> • FFA: Dairy Cattle Management and Evaluation, Horse Evaluation, Livestock Evaluation, Poultry Evaluation, Veterinary Science 	<ul style="list-style-type: none"> • HOSA: Veterinary Science
14	Use the periodic table and the atomic chart to compare differences between ionic and covalent bonding as related to digestion. Demonstrate an understanding of the interdependence of the complex chemical and biological processes involved in the digestion process including, but not limited to, the following: elements, compounds, mixtures, and acids. (TN Reading 1; TN A&P 5; TN Chemistry I 1; TN Chemistry II 1, 2, 3)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	
15	Research the relationship between metabolism, energy, and nutrition. Evaluate life stage and activity level to determine the nutritional needs of animals. Differentiate types of rations to maximize animal performance. (TN Writing 8, 9)	<ul style="list-style-type: none"> • FFA: Veterinary Science 	<ul style="list-style-type: none"> • HOSA: Veterinary Science
16	Apply concepts related to the basic cellular and biochemical processes in plants to demonstrate the following: <ul style="list-style-type: none"> a. Create a graphic illustration of the parts and functions of plant cells b. Use quantitative reasoning to balance chemical equations related to plant processes c. Interpret the role of physics within the cohesion-tension theory and its significance to plant life d. Examine the roles of photopigments and the effects of different colors of light on plant growth (TN Reading 7; TN Writing 9; TN Math N-Q, A-REI; TN Biology II 7)	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	

17	Formulate a hypothesis about the correlation between plant nutrient deficiencies and soil composition. Conduct basic soil analysis to determine the chemical elements and nutritional levels available in soils essential for plant growth. Draw conclusions about the ability of soils to meet the nutritional requirements of plants. (TN Reading 3, 9; TN Writing 8; TN Biology II 7)	<ul style="list-style-type: none"> • Agriscience Fair • Environmental and Natural Resources • Land Evaluation 	
18	Research and develop illustrative models that compare and contrast the reproductive structures of plants, drawing out key differences between sexual and asexual reproduction processes. (TN Biology II 7)	<ul style="list-style-type: none"> • Agriscience Fair 	<ul style="list-style-type: none"> • FCCLA: Illustrated Talk • TSA: Desktop Publishing, Children’s Stories
19	Describe the structure and function of different seed components and summarize their roles in plant reproduction and propagation. (TN Biology II 7)	<ul style="list-style-type: none"> • Nursery and Landscaping 	
20	Describe the structures and functions of the male and female animal reproductive systems. Compare and contrast the differences of the reproductive systems between small and large animal species. (TN A&P 5)	<ul style="list-style-type: none"> • Veterinary Science 	<ul style="list-style-type: none"> • HOSA: Veterinary Science
21	Apply fundamental principles of physics as they relate to agricultural power and technology concepts in order to demonstrate the following: <ul style="list-style-type: none"> a. Analyze the relationship between speed, distance, and time b. Relate the types of simple machines to the law of machines and mechanical advantages c. Specify groups, sources, and forms of energy d. Analyze the principle of heat energy and describe the way heat travels e. Explain the law of conservation of energy f. Explain the production of energy and relate it to the invisible light spectrum (TN Physical Science 2)	<ul style="list-style-type: none"> • Agricultural Technology and Maintenance Systems 	<ul style="list-style-type: none"> • SkillsUSA: Sustainability Solutions
22	Identify different methods by which electrical energy can be produced. Discuss the safety hazards involved in each method as well as prevention and control methods relevant to electrical power supplies. Justify the use of different precautions for the prevention or management of electrical hazards and evaluate the efficacy of the prevention measures. (TN Writing 1, 4, 7, 9; TN Physical World Concepts 4; TN Physics 5)	<ul style="list-style-type: none"> • Agricultural Technology and Maintenance Systems 	<ul style="list-style-type: none"> • SkillsUSA: Electrical Construction Wiring, Industrial Motor Controls
23	Utilize the appropriate instruments needed to calculate and measure voltage, amperage, resistance, and wattage. (TN Reading 3; TN Math N-Q; TN Physical World Concepts 4; TN Physics 5)	<ul style="list-style-type: none"> • Agricultural Technology and Maintenance Systems 	<ul style="list-style-type: none"> • SkillsUSA: Industrial Motor Controls

24	Apply basic principles of thermodynamics to analyze the function of major components of gasoline and diesel fuel engines. (TN Physics 2)	<ul style="list-style-type: none"> • Agricultural Technology and Maintenance Systems • Agriscience Fair 	<ul style="list-style-type: none"> • SkillsUSA: Automotive Service Technology, Diesel Equipment Technology, Motorcycle Service Technology, Power Equipment Technology
25	Using quantitative reasoning and employing appropriate unit conversions, calculate horsepower and thermal efficiency in internal combustion engines by creating systems of equations that describe numerical relationships. (TN Math N-Q, A-CED)	<ul style="list-style-type: none"> • Agricultural Technology and Maintenance Systems 	<ul style="list-style-type: none"> • SkillsUSA: Automotive Service Technology, Diesel Equipment Technology, Motorcycle Service Technology, Power Equipment Technology
ALL	CAN BE USED WITH ALL/MOST STANDARDS	<ul style="list-style-type: none"> • Agriscience Fair • Extemporaneous Public Speaking • FFA Ceremonies • FFA Creed • Prepared Public Speaking 	<ul style="list-style-type: none"> • HOSA: Prepared Speech, Extemporaneous Speaking • SkillsUSA: Career Pathways Showcase, Job Skills Demonstration A or Open