



CTSO Course Alignments: Applied Environment Science

Below you will find standards for the Applied Environmental Science 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	Use local news media, organizational websites, and real-time labor market information to investigate occupations in environmental science. Compare and contrast the knowledge, skills, and abilities necessary for employment, as well as the typical level of education required. (TN Reading 2, 9; TN Writing 4, 7, 9)	<ul style="list-style-type: none"> • FFA: Job Interview 	<ul style="list-style-type: none"> • FCCLA: Job Interview, Career Investigation, Entrepreneurship • HOSA: Job Seeking Skills, Researched Persuasive Speaking • SkillsUSA: Job Interview, Entrepreneurship, Employment Application Process • TSA: Career Preparation, Essays on Technology
2	Review common laboratory safety procedures for tool and equipment operation in the agricultural and biosystems engineering laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy. (TN Reading 3; ARNR CS)		<ul style="list-style-type: none"> • SkillsUSA: Occupational Health and Safety

3	Define the scope and impact of contemporary environmental science. Describe the interdisciplinary nature of this field and provide examples of how other sciences such as biology, chemistry, earth science, and physics relate to environmental science. Research scholarly, peer-reviewed academic journals focused on the biophysical environment and identify leading academic and professional organizations publishing results of environmental research. (TN Reading 2, 5; TN Writing 7)	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	<ul style="list-style-type: none"> • FCCLA: Environmental Ambassador
4	Define the term biome and indicate on a map the major biomes of the world. Develop an annotated graphic that can be used to compare and contrast the climates, seasons, soil characteristics, water availability, and other defining features of each biome. Differentiate between biomes within the following categories: aquatic, grasslands, forest, desert, and tundra. (TN Reading 4, 7; TN Writing 4, 9; TN Biology I 2; TN Biology II 2; TN Ecology 5; TN Environmental Science 2)	<ul style="list-style-type: none"> • FFA: Agronomy, Environmental and Natural Resources, Forestry, Land Evaluation 	<ul style="list-style-type: none"> • TSA: Promotional Graphics
5	Apply basic business and entrepreneurship principles to plan, set up, operate, or expand an environmental science related Supervised Agricultural Experience (SAE) program. Compare the components of SMART goals in relation to evaluating the success of the program. Accurately maintain the prescribed activity recordkeeping system and apply proper financial recordkeeping skills as they relate to the SAE program. (TN Reading 2; TN Writing 4, 9)	<ul style="list-style-type: none"> • FFA: Job Interview 	<ul style="list-style-type: none"> • DECA Community Service Project, Creative Marketing Project, Public Relations Project, Entrepreneurship Innovation Plan, Entrepreneurship Participating, Entrepreneurship Written, Entrepreneurship Growing Your Business • FBLA Agribusiness • FCCLA: Entrepreneurship, SkillsUSA: Entrepreneurship
6	Using instructional materials and news media, research the evolving impact of humans on the environment, from primitive societies to contemporary civilizations. Synthesize analysis in an explanatory essay or presentation that highlights specific milestones and events, citing textual evidence of both positive and negative impacts. (TN Reading 1, 2; TN Writing 2, 4, 7, 9)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador
7	Synthesize census data and other resources to compare U.S. population statistics to those of other countries around the world. Specifically examine growth rate, age structure, life expectancy, and total population, among other key parameters. Analyze the factors that impact population growth, and assess the impact of population growth in the U.S. and the world on the following: availability of natural resources, land usage, waste production and pollution, and global economic health. (TN Reading 2, 4, 5, 9; TN Environmental Science 3)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Advocacy • HOSA: Researched Persuasive Speaking • TSA: Essays on Technology

8	<p>Research the components of an ecosystem. Synthesize findings by developing a glossary of terms essential to the study of ecosystems, defining at least the following: habitat, niche, producers, consumers, and vertical stratification. (TN Reading 4, 5; TN Writing 4, 7, 9; TN Biology I 3; TN Biology II 3; TN Ecology 4; TN Environmental Science 4, 5)</p>	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	
9	<p>Compare and contrast grassland, forest, aquatic, and wetland ecosystems including types and species, and explain how biogeochemical cycles and food webs facilitate the flow of energy and the recycling of matter, supplying examples of species that fulfill key roles in each ecosystem. Illustrate similarities in the structure and life processes of ecosystems despite key differences across types of ecosystems. (TN Reading 5, 9; TN Writing 4, 7, 9; TN Biology I 3; TN Biology II 3; TN Ecology 4; TN Environmental Science 4, 5)</p>	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources, Forestry 	<ul style="list-style-type: none"> • HOSA: Researched Persuasive Speaking • TSA: Children’s Stories, Essays on Technology
10	<p>Analyze how the abiotic and biotic components of the ecosphere interact with and impact one another. Apply knowledge of these interactions to determine the suitability of an area for different types of development (such as commercial, industrial, and primary residential). Develop a claim about a development issue that impacts a selected ecosphere, supporting the claim with evidence and sound reasoning from research. (TN Reading 2, 5; TN Writing 1, 9; TN Biology I 3; TN Biology II 3; TN Ecology 4; TN Environmental Science 2)</p>	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	<ul style="list-style-type: none"> • FCCLA: Advocacy • HOSA: Biomedical Debate • TSA: Debating Technological Issues
11	<p>Create a graphic and accompanying text illustrating primary and secondary succession in a selected biome. Include a discussion of the pioneer species for that biome. Compare immature and mature ecosystems and discuss indicators that can be observed to determine maturity and quality of the ecosystem. (TN Reading 7; TN Writing 4, 9; TN Ecology 5; TN Environmental Science 2)</p>	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	<ul style="list-style-type: none"> • TSA: Children’s Stories, Promotional Graphics
12	<p>Citing case studies from news media, academic journals or instructional materials, discuss the importance of biodiversity in an ecosystem. Assess how various land uses might impact biodiversity in a given area. Summarize findings an informational essay on one of the following topics:</p> <ol style="list-style-type: none"> Impact of the intentional or unintentional introduction of non-native species to an ecosystem Threatened and endangered species Agricultural Best Management Practices that promote biodiversity <p>(TN Reading 1, 2; TN Writing 2, 4, 7, 8, 9; TN Biology I 2; TN Biology II 2; TN Ecology 5; TN Environmental Science 2)</p>	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador • HOSA: Researched Persuasive Speaking • TSA: Essays on Technology

13	Identify energy resources used in the United States and abroad, distinguishing between renewable and nonrenewable resources. Research the global distribution of energy resources; determine major resource-rich regions and how they intersect with geopolitical boundaries. (TN Environmental Science 4, 5, 7)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	
14	Synthesize public data from government agencies and news organizations to compare energy consumption in the United States to the energy consumption of other countries. Create a series of graphs and charts to inform an average citizen about energy use trends and statistics, including the percentage of each resource that comes from domestic and foreign sources. Investigate claims made about the political and economic implications of using foreign energy resources, analyzing author's purpose and assess the extent to which the reasoning and evidence provided support the author's claim. (TN Reading 2, 6, 7, 8; TN Writing 4, 7, 8; TN Environmental Science 5, 7)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador • HOSA: Researched Persuasive Speaking • TSA: Essays on Technology
15	Investigate available print and digital tools for conducting an audit of personal energy use. Compile and analyze self-collected data on total energy use, including transportation, water, and electricity consumption, among others. Create and implement a plan to reduce personal energy use. Compare the usage data after one month of implementing the plan, and discuss key takeaways learned from the project. (TN Writing 4, 7; TN Environmental Science 5, 7)		<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador
16	Research standard methods for monitoring a variety of environmental conditions, including but not limited to air, water, and soil, as well as the biological components of an ecosystem. For each domain, create a fact sheet outlining common tests and procedures and the kinds of information learned from the analysis of test results. Demonstrate at least one procedure for learning about each domain. (TN Reading 2, 3; TN Writing 2, 4, 7; TN Biology I 2; TN Biology II 2; TN Ecology 5; TN Environmental Science 2)	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	
17	Research sustainability as it applies to ecosystems and natural resources. Explain the importance of ensuring sustainability when developing a management plan for a specific resource or ecosystem. Outline the components of a management plan, and summarize best practices for the management of forest, wetland, aquatic, and grassland ecosystems. (TN Reading 2, 5; TN Writing 2, 4, 7, 9; TN Environmental Science 2, 4)	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources, Forestry 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador

18	Describe the evolution of integrated pest management (IPM) strategies through history. Create a brochure that explains the purpose and principles of IPM. Present specific IPM strategies for controlling common home and landscape pests. Create additional informational sheets for large-scale pest control in a variety of natural and human engineered environments. (TN Reading 2; TN Writing 4; TN Environmental Science 4)	<ul style="list-style-type: none"> • FFA: Agricultural Communications, Marketing Plan 	
19	Citing specific legislation and international conventions and treaties, create a timeline depicting the historical development of environmental regulation at the state, national and global levels. For each regulation represented on the timeline, summarize the intended goals and ultimate impact of that regulation. Include legislation related to air, water, toxic substances, wastes, energy resources, and mandated environmental impact studies. (TN Reading 1, 2, 7; TN Writing 4, 7, 9; TN Environmental Science 7)	<ul style="list-style-type: none"> • FFA: Agricultural Issues, Environmental and Natural Resources 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador
20	Describe the role of federal, state, and local governments in enforcing environmental legislation. Differentiate between key agencies at each level and justify the need for general regulations of environmental hazards. (TN Reading 2)	<ul style="list-style-type: none"> • FFA: Environmental and Natural Resources 	
21	Choose a current environmental issue and conduct research on environmental and ethical implications for potential solutions. Craft an argumentative essay, developing a claim supporting a specific solution and develop both claim(s) and counterclaim(s) with logical evidence and reasoning. (TN Reading 1, 8; TN Writing 1, 7, 8, 9; TN Environmental Science 7)	<ul style="list-style-type: none"> • FFA: Agricultural Issues 	<ul style="list-style-type: none"> • FCCLA: Advocacy, Environmental Ambassador • HOSA: Biomedical Debate, Researched Persuasive Speaking • TSA: Debating Technological Issues, Essays on Technology
ALL	CAN BE USED WITH ALL/MOST STANDARDS	<ul style="list-style-type: none"> • FFA: Agriscience Fair 	<ul style="list-style-type: none"> • FCCLA: Illustrated Talk, Chapter in Review Display, Chapter in Review Portfolio • SkillsUSA: Career Pathways Showcase, Job Skills Demonstration A, Job Skills Demonstration O, Prepared Speech, Extemporaneous Speaking, Chapter Display