Alabama TSA Competitive Event Summaries

Middle School Events

Architecture and Construction Technology

Off the Grid
Based on the annual theme, participants conduct research on a sustainable architectural design for a home in a country not their own. Participants produce a portfolio and create a display and a model. Semifinalists present their design and participate in an interview.
Structural Engineering
Participants apply the principles of structural engineering to design and construct a structure that complies with the annual challenge. An assessment of the required documentation and the destructive testing of the structure (to determine its design efficiency) determine both semifinalists and finalists.

Communications Technology

Challenging Technology Issues
Following the onsite random selection of a technology topic from a group of pre-conference posted topics, participants work to prepare for and deliver a debate-style presentation, in which they explain opposing views of the selected topic.
Children's Stories
Participants create an illustrated children's story based on the annual theme. The entry product is a physical storybook of artistic, instructional, and social value. Semifinalists read their story aloud and participate in an interview.
Essays on Technology
Participants conduct research on specific subtopics from a broad technology area posted as part of the annual theme. Using a previously prepared note card as an approved resource, participants draft an outline of the subtopic randomly selected onsite at the conference. Semifinalists write an essay on that subtopic.
Prepared Speech
Participants deliver a timed speech that relates to the theme of the current national TSA conference. Semifinalists and finalists are determined using the same competition procedure.
Promotional Marketing
Participants create and submit a marketing portfolio and required elements that address the annual theme/problem. Semifinalists complete a layout and design assignment for evaluation.
Vlogging
Participants use digital video technology to create original content about a pre-determined technology theme. Semifinalists compete in an onsite challenge to produce additional video(s) based on specified criteria, such as provided props, lines of dialog, and topics.

Computer Science and Information Technology

Coding
To qualify for the semifinal round of competition, participants take a test that concentrates on computer science and coding. Semifinalists demonstrate their programming knowledge by developing a solution to an onsite coding challenge.

Cybersecurity Foundations
Participants take a test that assesses knowledge of cybersecurity vocabulary and the skills needed to execute common cybersecurity tasks. Using digital presentation software, semifinalists deliver a presentation that addresses the annual theme/problem.

Data Science and Analytics
Participants conduct research on the annual topic, collect data, use analytics to assess the data and make predictions, and document their work in a portfolio and a display. To address a challenge presented onsite at the conference, semifinalists review specific data sets, provide insights, make predictions, and present their findings for evaluation.

Microcontroller Design
To address the annual theme/problem, participants design and create a working digital device, document the development process, and demonstrate their product as part of a presentation.

Video Game Design
Participants design, build, provide documentation for, and launch an E-rated, online game on a subject of their choice. Onsite at the conference, semifinalists deliver a presentation and participate in an interview to demonstrate the knowledge and expertise gained during the development of the game.

Website Design
To address the annual challenge, participants design, build, provide documentation for, and launch a website that incorporates the elements of website design, graphic layout, and proper coding techniques. Semifinalists participate in an interview to demonstrate the knowledge and expertise gained during the development of the website.

Leadership

Career Prep
Based on the annual theme, participants conduct research on a technology-related career, prepare a letter of introduction to a potential employer, and develop a job-specific resume. Semifinalists participate in a mock job interview.

Leadership Strategies
Participants prepare for and deliver a presentation about a specific challenge that officers of a TSA chapter might encounter. Semifinalists follow the same competition procedure but must respond to a different chapter challenge.

Tech Bowl
Participants demonstrate their knowledge of TSA and concepts addressed in technology content standards by completing an objective test. Semifinalists participate in a head-to-head, team competition.

Manufacturing and Transportation Technology

Dragster
Participants design, draw, and construct a CO2-powered dragster that adheres to the annual specifications, design and documentation requirements, and theme. Semifinalists participate in an interview and compete in a double-elimination race.

Flight
Participants submit a documentation portfolio and fabricate a glider designed to stay in flight for the greatest elapsed time. Semifinalists use their technical drawing skills to construct a glider that is flown onsite.

Junior Solar Sprint (JSS)
Participants apply STEM concepts, creativity, teamwork, and problem-solving skills to design, construct, and race a solar-powered model car. Documentation of the process is required. Learn more about JSS, then register via an Army Educational Outreach Program (AEOP) portal to begin the JSS journey.

Mechanical Engineering
Participants design, document, and build a mechanical device (mousetrap car) that incorporates the elements of the annual theme/problem – and then race the car. Finalists are determined based on an evaluation of the documentation portfolio, the race exit interview, and the race placement.

VEX IQ Challenge
Participants collaborate on a robotics project – in which they build a robot that incorporates the relationship among STEM fields – culminating in a robot skills challenge that evaluates the robot's efficiency and productivity.

STEM (General)

Computer Aided Design (CAD) Foundations
Participants demonstrate their understanding of CAD fundamentals by creating a two-dimensional (2D) graphic representation of an engineering part or object and answering questions from evaluators about their entry.

Inventions and Innovations
To address the annual theme, participants research a need - and brainstorm a solution - for an invention or innovation of a device, system, or process. Participants document their work in an interactive display and the creation of a model/prototype. Semifinalists deliver a presentation about their work and participate in an interview.

Problem Solving
Participants use problem-solving skills to design and build a solution to an onsite challenge. Solutions are evaluated using measures appropriate to the challenge, such as elapsed time, horizontal or vertical distance, and/or strength.

Video Game Design
Participants design, build, provide documentation for, and launch an E-rated, online game on a subject of their choice. Onsite at the conference, semifinalists deliver a presentation and participate in an interview to demonstrate the knowledge and expertise gained during the development of the game.

STEM and the Arts

Digital Photography
Participants produce and submit a digital photographic portfolio that relates to the annual theme. Semifinalists participate in an onsite photographic challenge and a presentation/interview.

Technology and Research

Forensic Technology
Participants take a test of basic forensic science theory to qualify for the semifinal round of competition. Semifinalists participate in an onsite forensic skills demonstration.
Medical Technology
Participants conduct research on a contemporary medical technology issue related to the annual theme, document their research, create a display, and build a prototype. Semifinalists deliver a presentation about their entry and participate in an interview.
System Control Technology
In response to a challenge presented onsite at the conference, participants analyze a problem (typically one in an industrial setting), build and program a computer-controlled mechanical model to solve the problem, explain the program and the features of the mechanical model solution, and provide instructions for evaluators to operate the device.

High School Events

Architecture and Construction Technology

Architectural Design
In response to the annual design challenge, participants develop a set of architectural plans and related materials, and construct both a physical and computer-generated model to accurately depict their design. Semifinalists deliver a presentation and participate in an interview.
Computer-Aided Design (CAD), Architecture
Participants use complex computer graphic skills, tools, and processes to respond to a design challenge in which they develop representations of architectural subjects, such as foundation and/or floor plans, and/or elevation drawings, and/or details of architectural ornamentation or cabinetry. The solution to the design challenge and participant answers in an interview are evaluated.
Computer-Aided Design (CAD), Engineering
Participants use complex computer graphic skills, tools, and processes to respond to a design challenge in which they develop three-dimensional representations of engineering subjects, such as a machine part, tool, device, or manufactured product. The solution to the design challenge and participant answers in an interview are evaluated.
Structural Design and Engineering
Participants apply the principles of structural engineering to design and construct a structure that complies with the annual challenge. An assessment of the required documentation and the destructive testing of the structure (to determine its design efficiency) determine both semifinalists and finalists.

Communications Technology

Audio Podcasting
Participants use digital audio technology to create original content for a podcast piece that addresses the annual theme. The podcast must feature high level storytelling techniques, voice acting, and folly sound effects; the full entry must include documentation of the podcast development process and elements. Semifinalists participate in an interview.

Children's Stories
In response to the annual theme, participants create an illustrated children's story of artistic, instructional, and social value, and submit documentation related to the development of the physical storybook. Semifinalists read their story aloud and participate in an interview.

Debating Technological Issues
Participants research the annual topic and subtopics and prepare for a debate against a team from another chapter. Teams are instructed to take either the pro or con side of a selected subtopic, submit a summary of references, and use their research to support their assigned position. The quality of a team's debate determines semifinalists and finalists.

Promotional Design
Participants use computerized graphic communications layout and design skills to produce a promotional resource packet. The resource must address the annual theme/problem and include at least four printed publication items and required documentation. Semifinalists demonstrate publishing competency in an onsite technical design challenge.

Computer Science and Information Technology

Coding
Participants take a test, which concentrates on aspects of coding, to qualify for the semifinal round of competition. Semifinalists develop a software program – in a designated amount of time – that accurately addresses an onsite problem.

System Control Technology
Participants develop a solution to a problem (typically one from an industrial setting) presented onsite at the conference. They analyze the problem, build a computer-controlled mechanical model, program the model, demonstrate the programming and mechanical features of the model-solution in an interview, and provide instructions for evaluators to operate the model.

Video Game Design
Participants design, build, and launch an E-rated online video game – with accompanying required documentation - that addresses the annual theme. Semifinalists participate in an interview to demonstrate the knowledge and expertise they gained during the development of the game.

Webmaster
Participants design, build, and launch a website that addresses the annual challenge. Semifinalists participate in an interview to demonstrate the knowledge and expertise gained during the development of the website.

Leadership

Chapter Team
Participants take a parliamentary procedure test to qualify for the semifinal round of competition. Semifinalists conduct an opening ceremony, items of business, parliamentary actions, and a closing ceremony.
Extemporaneous Speech
Participants select a technology-related or TSA topic from among three topic cards and prepare and give a three-to-five-minute speech that communicates their knowledge of the chosen topic. The quality of the speech determines advancement to the semifinalist level of competition, for which an identical competition procedure is followed to determine finalists.
Prepared Presentation
Participants deliver a three-to-five-minute oral presentation related to the current national TSA conference theme. Both semifinalists and finalists are determined based on the quality of the presentation and the appropriate use and content of the accompanying required slide deck.
Technology Bowl
Participants demonstrate their knowledge of TSA and concepts addressed in technology content standards by completing an objective test. Semifinalist teams participate in a question/response, head-to-head, team competition.

Manufacturing and Transportation Technology

Dragster Design
Participants design, draw, and construct a CO2-powered dragster that adheres to specifications, design and documentation requirements, and the annual theme. Semifinalists compete in a double-elimination race and participate in an interview.
Drone Challenge (UAV)
Participants design, build, assemble, document, and test fly an open-source Unmanned Arial Vehicle (UAV) according to the stated annual theme/problem specifications. The required documentation portfolio must include elements such as a photographic log, wiring schematics, and a description of the programming software used. Semifinalists participate in an interview.
Flight Endurance
Participants design, build, fly, and adjust (trim) a rubber-band powered model aircraft to make long endurance flights inside a contained airspace. Documentation (including elements such as attributes of the model design, drawings, and an analysis of the trim modifications), an inspection of the model and the required model flight box, and official times for two flights are aspects of the evaluation.
Senior Solar Sprint
The Senior Solar Sprint (SSS) competition is managed by TSA. Students apply scientific understanding, creativity, experimentation, and teamwork to design, build, and race a model solar vehicle that carries a payload; documentation of the process is required. Students must register via an Army Educational Outreach Program (AEOP) portal to participate and begin the SSS journey.
Robotics
Participants design, build, document, and test a robot assembled using open-sourced parts according to stated specifications and to meet the challenge of the yearly theme/problem.

STEM (General)

Engineering Design
Participants develop a solution to an annual theme that is based on a specific challenge noted by the National Academy of Engineering (NAE) in its compilation of the grand challenges for engineering in the 21st century. The solution will include a documentation portfolio, a display, and a model/prototype. Semifinalists deliver a presentation and participate in an interview.

Technology Problem Solving
Participants use problem-solving skills to design and construct a finite solution to a challenge provided onsite at the conference. Solutions are evaluated at the end of 90 minutes using measures appropriate to the challenge, such as elapsed time, horizontal or vertical distance, and/or strength.

Video Game Design
Participants design, build, and launch an E-rated online video game – with accompanying required documentation - that addresses the annual theme. Semifinalists participate in an interview to demonstrate the knowledge and expertise they gained during the development of the game.

STEM and the Arts

Animatronics
To address the annual design challenge, participants exhibit and demonstrate their knowledge of mechanical and control systems by creating an animatronic device with a specific purpose (i.e., communicate an idea, entertain, demonstrate a concept, etc.) that includes sound, lights, and an appropriate surrounding environment (a display).

Digital Video Production
Participants develop and submit a digital video and a documentation portfolio (including such items as a storyboard, script, summary of references and sources, and equipment list) that reflects the annual theme. Semifinalists participate in an interview.

Photographic Technology
Participants produce a photographic portfolio - demonstrating expertise in photo and imaging technology processes - to convey a message based on the annual theme. Semifinalists have 24 hours to complete a portfolio of photos (with required documentation) taken onsite at the national TSA conference. Finalists are determined based on the quality of the semifinal portfolio, the portfolio presentation, and interview responses.

Technology and Research

Biotechnology Design
Participants select a contemporary biotechnology problem that addresses the annual theme and demonstrates understanding of the topic through documented research, the development of a solution, a display (including an optional model or prototype), and an effective multimedia presentation. Semifinalists deliver a presentation and participate in an interview.

Forensic Science
Participants take a test of basic forensic science to qualify for the semifinal round of competition. Semifinalists examine a mock crime scene and demonstrate their knowledge of forensic science through crime scene analysis, with the findings synthesized in a written report/analysis.

System Control Technology
Participants develop a solution to a problem (typically one from an industrial setting) presented onsite at the conference. They analyze the problem, build a computer-controlled mechanical model, program the model, demonstrate the programming and mechanical features of the model-solution in an interview, and provide instructions for evaluators to operate the model.