State Leadership Conference 2025

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** **STATE** Only event, rules and regulations will be posted on www.montanatsa.com

* Event has an online submission, test, timed event or theme

*Events without ** will be using the TSA National Event guidelines and rubrics. These can be found in your Total TSA.*

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1. 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).

***Design Problem**: Following the specified requirements, create an animatronic exhibit for a public library to excite young readers.*

2. **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.

***Design Problem**: Select a type and location for a museum of the team's choice and then design a museum that meets the considerations and constraints.*

3. **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.

***Theme**: Preparing to compete in a TSA event and/or preparing for your first TSA conference*

4. **Board Game Design**

Participants develop, build, and package a board game that focuses on a subject of their choice. Creative packaging, and the instructions, pieces, and cards associated with the pilot game will be evaluated. Semifinalists set up the game, demonstrate how the game is played, explain the game's features, and discuss the design process.

5. **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.

***All affiliated chapters should have a team participate in the online written test**. Semifinalists will compete in the onsite finals.*

6. **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.

The following programming languages may be used to complete the assigned problems:

- *C version C17*
- *C++ version C++20*
- *C# version 8*
- *Java version 21.0*
- *Javascript/Node version 18.19*

- *Python version 3.9*
- *Ruby version 3.2*
- *Rust version 1.75*
- *Swift version 5.10*

7. **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. ***This is a 3 hour onsite State Conference event.***

8. **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. ***This is a 3 hour onsite State Conference event.***

9. **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.

   Address weights and lengths only; there are no special design challenges.

10. **Drone Challenge (UAV)**

    Participants design, build, assemble, document, and test fly an open-source Unmanned Aerial 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.

    A committee will work on requirements, we will be using pre-built drones and fly an assigned course. Details to come.

11. **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.

12. 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.

13. Manufacturing Prototype

Participants design, fabricate, and use Computer Integrated Manufacturing (CIM) to create a product that addresses the annual theme. A documentation portfolio and the completed product prototype are submitted for evaluation. Semifinalists give a product "sales pitch" and demonstration.

***Theme**: An item that can be used as picture frames for a home or office while also serving another purpose.*

14. Music Production

Participants produce an original musical piece designed to be played during the closing session of the national TSA conference. The quality of the musical piece and required documentation (including elements such as a plan of work, self-evaluation, and a list of hardware, software, and instruments used) determines advancement to the semifinal level of competition, during which semifinalist participants are interviewed.

***Theme:** Create a musical piece that will be used as the background music for a role-playing game (RPG) video game. It will be played during the parts of the game when the player's character is visiting the blacksmith.*

15. 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.

***Theme**: Using five photographs, tell a story about your journey in TSA. The type of photo (color, black and white, macro, still life, and student choice) should add to the impact of the story you are sharing.*

16. 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.

***Theme**: Develop a presentation that highlights the field of digital music production, including the timeline of its origin, development, fruition, and release of the technology on a global scale.*

17. 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.

***Theme**: Branding materials for a fictitious restaurant; the four (4) Promotional Folder items are student choice.*

18. Robotics (Replaces VEX)

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.

ROBOTICS COMPETITORS ARE TO ENGINEER AND BUILD AN OPEN-SOURCE/COMMERCIALLY AVAILABLE ROBOT. See more information on the National TSA website.

19. Senior Solar Sprint

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 on Cvent to participate and begin the SSS journey.

20. STEM Mass Media (New)

In response to an annual theme, participants use written and verbal communication skills to convey a news story in both a video broadcast (preliminary round) and a digital written format (semifinal round). Participants must demonstrate a strong understanding of journalism etiquette and the common practices of the field of mass media.

Based on the following headline (link below), develop a news broadcast that includes an introduction of the headline, a summary of the information in the news story, and an explanation of potential future implications of the highlighted work.

https://www.eurekalert.org/news-releases/1039721

21. 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.

The design brief for 2025 is to design a pair of two (2) balsa tower structures that will support the greatest load possible using the least materials. The solutions must transfer the load from the architrave to the base as efficiently as possible.

22. 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.

23. 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.

24. 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.

Topic: A restaurant (dine-in and carry-out) that specializes in vegetarian food

Challenge: Design a website for a vegan/vegetarian restaurant. Showcase the restaurant's approach (such as farm-to-table, preparation processes, and sustainability) to the food served in the restaurant.

25. Career Preparation**

The purpose of this event is to provide participants the opportunity to practice preparation for a career. Participants research the career of **"CTE Teacher"**, prepare a resume and cover letter for the career, and prepare to participate in a mock interview about the career.

26. Chapter Display**

The Program Promotion display is designed to make a promotional statement about your school's Technology program and TSA Chapter. The display gives your school and students the opportunity to do a little showing-off. Displays should in some way depict what each school's Technology and TSA programs are about.

27. Gravity Cruiser**

Gravity Cruiser Challenge Students focus on understanding the relationships between the "sweep" of the lever arm, the number of winds the string makes around the axle, and the distance the gravity cruiser travels. They also investigate how the diameter of the wheels, the diameter of the axles, and the amount of weight placed on the lever affect the gravity cruiser's speed and distance. This challenge introduces a rich activity in critical thinking while at the same time providing an enjoyable "vehicle" for learning how to use the experimental method to test hypotheses and solve an engineering problem.

28. MetalWorking/Sculpture**

The contest is designed to assess the ability of the competitor to design and produce a sculpture, as well as answer questions in a brief interview related to all aspects of his or her creation of the design.

Theme for the 2025 SLC is "Robotics"

29. Sticker Design Challenge**

The State Sticker Design contest provides an opportunity for participants to use design and layout skills to create a graphic design promoting the Montana Technology Student Association, as well as develop a spirit of pride and enthusiasm for Montana. The selected sticker will be shared at the State Leadership Conference.

Due March 7, 2025

30. Techno Talk**

The purpose of this activity is to test the student's ability to communicate in writing what a product looks like and how it is assembled in such a way that their partner is able to build the product.