

Animatronics – Judge Overview

- **What it is:**
High school teams design and build robotic devices that bring characters or objects to life using motion, sound, lights, and control technology.
- **What judges do:**
Evaluate the creativity, craftsmanship, and functionality of each animatronic device, along with a short student presentation and Q&A session.
- **Judging format:**
 - **Preliminary Round:** Teams give a **5-minute presentation** followed by a **2-minute Q&A**. Judges score both performance and interview.
 - **Semifinal Round:** Top 12 teams repeat the process to determine finalists.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Hands-on demonstrations with moving mechanical and electronic components.
 - Creative, story-driven presentations from students explaining their engineering process.
 - Professional yet fun judging environment with **clear scoring rubrics**.
 - **2025 saw only 1 entry in this event.**
- **Ideal judge backgrounds:**
 - Engineering (mechanical, electrical, or industrial)
 - Robotics or automation
 - Electronics or control systems
 - Industrial design or special effects
 - Mechanical fabrication or prototyping
 - Appreciation for creativity, design, and storytelling in technical projects

Architectural Design – Judge Overview

- **What it is:**
High school students apply architectural design principles to create original building concepts in response to an annual design challenge. Each team produces a full documentation portfolio, a physical scale model, and a digital rendering that together communicate their solution.
- **What judges do:**
Evaluate student work based on design quality, technical documentation, creativity, and presentation skills. Judges score the written portfolio, physical model, and semifinal presentation/interview.
- **Judging format:**
 - **Preliminary Round:** Judges review digital documentation submitted before the conference and evaluate physical models on-site to select the top 12 semifinalists.
 - **Semifinal Round:** Semifinalists give a **7-minute presentation** followed by a **2-minute Q&A**, allowing judges to assess design understanding and communication.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Professionally presented architectural portfolios and scale models.
 - Student teams explaining their design concepts, layout, and building systems.
 - A mix of technical and creative discussions with aspiring architects and designers.
 - **2025 saw 5 entries in this event.**
- **Ideal judge backgrounds:**
 - Architecture or architectural drafting
 - Interior or urban design
 - Construction management or civil engineering
 - CAD, 3D modeling, or building information modeling (BIM)
 - Experience reviewing or developing building plans and design documentation

Audio Podcasting – Judge Overview

- **What it is:**
Students create original audio podcasts based on an annual technology theme, showcasing storytelling, audio production, voice acting, sound design, and creative communication. Semifinalists also complete an additional on-site podcasting challenge during the conference.
- **What judges do:**
Evaluate podcast content for creativity, clarity, audio quality, storytelling structure, pacing, and listener appeal. Judges also review documentation portfolios that explain the production process, copyright compliance, audio timelines, and technical decisions.
- **Judging format:**
 - **Preliminary Round:** Judges first score all audio podcast submissions to identify the top 24, then score the documentation portfolios of those entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Semifinalists receive an on-site prompt and have **36 hours** to produce and submit additional podcast content for judging.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - A wide range of creative audio content—fiction, narrative, interviews, soundscapes, and themed storytelling.
 - Detailed documentation outlining production choices, audio element sourcing, and workflow.
 - Semifinal entries produced under time pressure using participant-provided equipment.
 - **2025 saw 11 entries in this event.**
- **Ideal judge backgrounds:**
 - Audio engineering, sound design, music production, or broadcasting
 - Podcasting, voice acting, or media production
 - Creative writing, scriptwriting, or communications
 - Experience reviewing narrative, technical audio quality, or digital media projects

Biotechnology Design – Judge Overview

- **What it is:**
Students research a contemporary biotechnology issue based on the annual theme and create an interactive museum-style display, documentation portfolio, and multimedia presentation explaining impacts, solutions, and real-world applications.
- **What judges do:**
Evaluate the display, scientific communication, research depth, documentation quality, and the clarity and professionalism of the semifinal presentation/interview.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the interactive display, then score documentation portfolios of the top 24 entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Semifinalists deliver a **7-minute presentation** followed by a **2-minute Q&A** using their display and portfolio.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Museum-style displays, optional models, and visual explanations.
 - Student research on environmental, economic, social, and ethical impacts.
 - Clear communication of biotechnology concepts and problem/solution reasoning.
 - **2025 saw 0 entries in this event.**
- **Ideal judge backgrounds:**
 - Biotechnology, biology, biomedical or environmental sciences
 - Scientific research, lab work, or STEM communication
 - Technical writing, data analysis, or science education

Board Game Design – Judge Overview

- **What it is:**
Students design, build, and package an original board game with complete rules, artwork, pieces, and documentation. The game must be fun, visually appealing, durable, and designed for a specific audience.
- **What judges do:**
Evaluate game appearance, construction quality, packaging, rule clarity, documentation portfolio, and semifinal gameplay demonstration.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the physical board game and packaging, then the documentation portfolios of the top 24 entries to identify the top 12 semifinalists.
 - **Semifinal Round:** Teams conduct a **7-minute game demonstration** followed by a **3-minute Q&A**, then repack the game within the allotted time.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fully produced physical board games with original components.
 - Engineering drawings, cost summaries, and design process documentation.
 - Clarifications of gameplay, intended audience, and design decisions.
 - **2025 saw 9 entries in this event.**
- **Ideal judge backgrounds:**
 - Board game design, game development, or product design
 - Graphic design, illustration, user experience design
 - Education, child development, or human-centered design
 - Technical writing or manufacturing processes

CAD: Architecture – Judge Overview

- **What it is:**
Students complete a 3-hour on-site architectural drafting challenge to create plans, elevations, or detailed architectural drawings using CAD software, followed by a short interview.
- **What judges do:**
Evaluate drawing accuracy, layout quality, architectural standards, symbol usage, spatial design, and the student's ability to explain their work.
- **Judging format:**
 - **Pre-event Setup:** Students have **30 minutes** to set up their own CAD systems and reference materials.
 - **Work Session:** Students complete the assigned challenge in a **3-hour timed session**.
 - **Interview:** Each student completes a **2-minute interview** covering CAD skills and design reasoning.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - On-screen evaluation of architectural drawings and drafting methods.
 - Solutions varying widely based on interpretation of the prompt.
 - Independent student work in a quiet, focused environment.
 - **2025 saw 2 entries in this event.**
- **Ideal judge backgrounds:**
 - Architecture, drafting, or construction technology
 - Professional CAD experience or CAD instruction
 - Spatial planning, residential/commercial design
 - Interior design or architectural graphics

CAD: Engineering – Judge Overview

- **What it is:**
Students complete a 3-hour on-site 3D modeling challenge to create an engineering component or product using CAD software, followed by a short interview.
- **What judges do:**
Evaluate the accuracy, completeness, geometric reasoning, CAD tool usage, engineering conventions, and layout quality of the completed model and drawings.
- **Judging format:**
 - **Pre-event Setup:** Students have **30 minutes** to set up hardware, software, and reference materials.
 - **Work Session:** Students create a 3D engineering solution in a **3-hour timed challenge**.
 - **Interview:** Students complete a **2-minute interview** about modeling decisions, tools, and features used.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Detailed 3D models, orthographic drawings, and feature-based modeling.
 - Varied approaches depending on student engineering interpretation.
 - A professional, technical work environment with independent problem solving.
 - **2025 saw 12 entries in this event.**
- **Ideal judge backgrounds:**
 - Mechanical engineering, manufacturing, or product design
 - CAD/CAE software expertise (SolidWorks, Inventor, Fusion 360, etc.)
 - Drafting instruction or engineering graphics
 - Prototyping, machining, or design engineering

Chapter Team – Judge Overview

- **What it is:**
Students demonstrate mastery of parliamentary procedure by taking a written test and conducting a full mock chapter meeting. Teams perform opening and closing ceremonies, process assigned parliamentary actions, and show their ability to run an efficient, well-organized meeting.
- **What judges do:**
Evaluate teams on their parliamentary procedure test performance, their accuracy and professionalism in meeting conduct, the correctness of motions, officer roles, teamwork, and the secretary's written minutes.
- **Judging format:**
 - **Preliminary Round:** Teams take a one-hour parliamentary procedures test; the top 12 average-scoring teams advance to semifinals.
 - **Semifinal Round:** Teams have up to **15 minutes** to conduct opening/closing ceremonies and perform five required parliamentary actions, plus optional advanced motions for bonus points. The secretary then has **5 additional minutes** to write the meeting minutes.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - A formal, scripted meeting demonstration with precise officer roles.
 - Students performing motions, debating appropriately, and completing business in a structured format.
 - A polished, leadership-focused event where communication, order, and teamwork are clearly observable.
 - **2025 saw 7 entries in this event.**
- **Ideal judge backgrounds:**
 - Experience with **parliamentary procedure** (Robert's Rules of Order).
 - Leadership, business meeting facilitation, or organizational governance.
 - Speech, debate, student leadership advising, or public speaking.
 - Educators or professionals familiar with structured processes and accuracy in documentation.

Children's Stories – Judge Overview

- **What it is:**
Students create an original, fully illustrated children's storybook based on the annual theme. They also produce a documentation portfolio detailing the writing, illustration, construction, and field-testing process.
- **What judges do:**
Evaluate the physical book, illustrations, narrative quality, craftsmanship, adherence to the theme, documentation portfolio, and the semifinal presentation/interview.
- **Judging format:**
 - **Preliminary Round:** Judges score the storybook to select the top 24, then review documentation portfolios for those entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a **10-minute presentation** followed by a **5-minute interview** discussing the story, illustrations, and design process.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - High-quality handmade storybooks with original illustrations.
 - Documentation including field-test summaries with children in the target age group.
 - Creative storytelling rooted in child development, literacy, and design principles.
 - **2025 saw 16 entries in this event.**
- **Ideal judge backgrounds:**
 - Elementary education, literacy, or child development
 - Illustration, graphic design, or book arts
 - Creative writing, publishing, or editing
 - Library science or children's literature

Coding – Judge Overview

- **What it is:**
Teams complete a preliminary written test on coding fundamentals, then semifinalists develop a functional software program in response to an on-site programming challenge within a two-hour time limit.
- **What judges do:**
Assess whether the on-site program meets requirements, observe solution efficiency, and verify correctness through automated or structured testing.
- **Judging format:**
 - **Preliminary Round:** All team members take a one-hour coding exam; the average of both scores determines the top 24 semifinal teams.
 - **Semifinal Round:** Teams receive a prompt and have **two hours** to design, code, and submit a working solution for evaluation.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - A range of programming languages (posted annually by TSA).
 - Students coding independently under strict time and resource limitations.
 - Solutions ranked by correctness, efficiency, and speed of completion.
 - **2025 saw 4 entries in this event.**
- **Ideal judge backgrounds:**
 - Software engineering or computer science
 - Competitive programming or algorithmic problem-solving
 - Application development, data structures, or software testing
 - STEM educators with coding expertise

Data Science and Analytics – Judge Overview

- **What it is:**
Students collect or compile a large dataset (at least 500 rows), analyze it, and present their findings in a digital scientific poster and documentation portfolio. Semifinalists complete an on-site two-hour visualization challenge.
- **What judges do:**
Evaluate the documentation portfolio, data analysis quality, interpretation accuracy, digital scientific poster clarity, and the semifinal on-site visualization and synopsis.
- **Judging format:**
 - **Preliminary Round:** Judges score the documentation portfolio PDF to identify the top 24, then evaluate each team's digital scientific poster in a **6-minute presentation**.
 - **Semifinal Round:** Semifinalists complete a **2-hour** visual data-representation challenge based on an on-site dataset.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Multi-page analysis portfolios with charts, graphs, methods, conclusions, and citations.
 - In-depth discussion of data trends, ethics, impacts, and insights.
 - Quickly produced visualizations created with students' own laptops (no internet provided).
 - **2025 saw 4 entries in this event.**
- **Ideal judge backgrounds:**
 - Data science, statistics, or analytics
 - Research, economics, or applied mathematics
 - STEM education in data-driven fields
 - Visualization, modeling, or scientific communication

Debating Technological Issues – Judge Overview

- **What it is:**
Two-member teams debate Pro or Con positions regarding technology-related subtopics released annually. Students demonstrate research, critical thinking, argument development, and public speaking skills.
- **What judges do:**
Evaluate the quality of arguments, organization, topic knowledge, delivery, cross-examination, rebuttal strength, and adherence to debate structure.
- **Judging format:**
 - **Preliminary Round:** Teams draw their subtopic and position, have **5 minutes** to prepare, then follow an 8-segment debate sequence (speeches, cross-examination, rebuttals). Judges rank debates to determine the top 12 semifinalists.
 - **Semifinal Round:** Same debate format is repeated with new topics.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fast-paced, structured debates with strict timing.
 - Students using notecards and reference summaries (MLA-formatted).
 - Clear, evidence-based arguments on current technological issues.
 - **2025 saw 14 entries in this event.**
- **Ideal judge backgrounds:**
 - Debate, public speaking, or communications
 - Law, policy, ethics, or government
 - Technology fields with strong analytical components
 - Educators experienced in argumentation or rhetoric

Digital Video Production – Judge Overview

- **What it is:**
Students create an original 3-minute digital video based on the annual theme, along with a detailed documentation portfolio showing their storyboard, script, production process, citations, permissions, and work log.
- **What judges do:**
Evaluate the digital video for communication quality, creativity, technical skill, and adherence to theme; then evaluate the documentation portfolio for planning, process, and professionalism. Semifinalists also complete a live interview.
- **Judging format:**
 - **Preliminary Round:** Judges score the video to identify the top 24 entries, then score the documentation portfolios of those 24 to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams participate in an interview lasting up to **10 minutes**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Original filmed content with student-produced audio, visuals, and effects.
 - Detailed multi-page production portfolios including scripts, sketches, references, and release forms.
 - Students discussing creative choices, filming challenges, and production workflows.
 - **2025 saw 10 entries in this event.**
- **Ideal judge backgrounds:**
 - Film production, cinematography, editing, or broadcasting
 - Media arts, animation, or video storytelling
 - Communications, journalism, or digital media education

Dragster Design – Judge Overview

- **What it is:**
Students design, build, document, and race a CO₂-powered dragster that meets precise engineering specifications. Entries include the physical dragster, a full-size technical drawing, and a parts/materials list.
- **What judges do:**
Evaluate dragster construction, engineering drawing quality, safety compliance, and race performance. Semifinalists also complete a 5-minute interview.
- **Judging format:**
 - **Preliminary Round:** Judges inspect cars for safety, run qualifying timed races, and score the dragster, drawing, and documentation to determine the top 16 semifinalists.
 - **Semifinal Round:** The top 16 complete a **5-minute interview** and race in a double-elimination format.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - High-precision student-engineered vehicles, often CNC or 3D-printed.
 - Close inspection of measurements, materials, safety rules, and race lane performance.
 - A fast-paced, exciting event with engineering accuracy at its core.
 - **2025 saw 17 entries in this event.**
- **Ideal judge backgrounds:**
 - Mechanical engineering, automotive engineering, or aerodynamics
 - Manufacturing, machining, or technical drafting
 - STEM educators familiar with specs-based engineering design

Drone Challenge (UAV) – Judge Overview

- **What it is:**
Teams design, build, assemble, document, and test an open-source UAV (drone) to complete an annual flight challenge. Students prepare an in-depth engineering and wiring portfolio and fly their custom-built drones in a timed task.
- **What judges do:**
Evaluate safety compliance, drone performance during test flights, documentation quality, engineering drawings, wiring schematics, and a semifinal technical interview.
- **Judging format:**
 - **Preliminary Round:** Judges conduct a safety inspection; teams perform test flights; the top 16 scoring drones advance for portfolio evaluation, producing the top 12 semifinalists.
 - **Semifinal Round:** Teams complete a **10-minute interview**, and scores from portfolio, challenge performance, and interview determine finalists.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fully custom-built UAVs with detailed wiring, programming, and assembly documentation.
 - A busy pit area with tools, batteries, repair work, and safety inspections.
 - Live drone flying requiring precision, safety awareness, and engineering competence.
 - **2025 saw 6 entries in this event.**
- **Ideal judge backgrounds:**
 - Aerospace engineering, robotics, UAV design, or flight systems
 - Electronics, wiring/soldering, programming, or embedded systems
 - STEM educators experienced in drones, robotics, or engineering design

Engineering Design – Judge Overview

- **What it is:**
Teams research a Grand Challenge for Engineering, prototype a solution, develop a free-standing display, and produce a comprehensive engineering documentation portfolio demonstrating every stage of the design process.
- **What judges do:**
Evaluate the prototype/model, display, and documentation for engineering rigor, clarity, testing quality, creativity, and alignment with the annual theme. Semifinalists deliver a presentation and answer questions.
- **Judging format:**
 - **Preliminary Round:** Judges score the display and prototype to identify the top 24, then evaluate their portfolios to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a **10-minute presentation** and **5-minute Q&A** in front of their display and prototype.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Highly detailed engineering portfolios showing research, ideation, testing, iteration, and refinement.
 - Physical prototypes demonstrating functionality, creativity, and real-world application.
 - Students explaining engineering decisions and analyzing test data.
 - **2025 saw 0 entries in this event.**
- **Ideal judge backgrounds:**
 - Mechanical, civil, electrical, or systems engineering
 - Product development, R&D, or prototyping
 - Engineering education or applied research

Extemporaneous Speech – Judge Overview

- **What it is:**
Students deliver a 3–5-minute impromptu speech on a technology-related topic after a 15-minute preparation period, demonstrating communication, reasoning, and organization skills.
- **What judges do:**
Evaluate delivery, content accuracy, speech structure, confidence, time management, and the effectiveness of addressing the selected topic.
- **Judging format:**
 - **Preliminary Round:** Students draw three topics, choose one, prepare for 15 minutes, and deliver the speech. Judges rank speeches to select the top 12 semifinalists.
 - **Semifinal Round:** The process repeats with new topics for the top 12.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fast-paced turnover of students entering the prep and speech rooms.
 - Clear, technology-focused speeches with minimal notes.
 - Professional public-speaking evaluation similar to competitive speech tournaments.
 - **2025 saw 23 entries in this event.**
- **Ideal judge backgrounds:**
 - Public speaking, communications, debate, or education
 - Technology professionals comfortable evaluating content accuracy
 - Leaders experienced in presentations or professional speaking

Fashion Design and Technology – Judge Overview

- **What it is:**
Teams design and construct wearable fashion prototypes based on the annual theme, submit student-made patterns, and assemble a documentation portfolio outlining design research, sketches, textiles, and construction.
- **What judges do:**
Evaluate garment construction, creativity, pattern quality, portfolio content, and the semifinal presentation/interview where teams explain their design decisions.
- **Judging format:**
 - **Preliminary Round:** Judges score the garment and patterns, then the portfolios of the top 24 entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Students present their garment in a **10-minute session** including setup, presentation, interview, and teardown.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - High-quality handmade fashion prototypes modeled on-site.
 - Sketches, textile research, design sheets, and technical sewing explanations.
 - Creative interpretations of the annual theme blending aesthetics and function.
 - **2025 saw 8 entries in this event.**
- **Ideal judge backgrounds:**
 - Fashion design, textile design, or garment construction
 - Costume design or fashion technology
 - Apparel manufacturing, tailoring, or patternmaking

Flight Endurance – Judge Overview

- **What it is:**
Students design, build, trim, and fly a rubber-powered model aircraft for maximum flight time. They also submit a portfolio including flight logs, engineering drawings, and design analysis.
- **What judges do:**
Evaluate aircraft construction, safety, documentation portfolio, trim strategy, and official flight results.
- **Judging format:**
 - Participants complete trim flights, then perform two official flights for recorded time.
 - Judges score flight results, inspect the aircraft and flight box, and review documentation to determine finalists.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Models built from lightweight materials such as balsa or foam.
 - Students making precise aerodynamic adjustments to maximize endurance.
 - Careful engineering documentation such as flight logs and structural drawings.
 - **2025 saw 5 entries in this event.**
- **Ideal judge backgrounds:**
 - Aeronautics, aerospace engineering, or model aviation
 - Physics, aerodynamics, or mechanical engineering
 - AMA/NFFS members or hobbyists experienced in free-flight modeling

Forensic Science – Judge Overview

- **What it is:**
Teams begin with a written forensic science exam, and semifinalists analyze a mock crime scene—collecting evidence, documenting findings, and producing a written report.
- **What judges do:**
Observe evidence collection techniques; evaluate documentation accuracy, crime-scene sketching, and written analysis quality.
- **Judging format:**
 - **Preliminary Round:** Both team members take the test; scores are averaged to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams spend **20 minutes** examining the scene and **20 minutes** writing their analysis.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Students using field kits to document, measure, photograph, and collect mock evidence.
 - Crime-scene sketches, labeled evidence bags, and analysis reports.
 - STEM-driven reasoning and methodical investigative procedures.
 - **2025 saw 14 entries in this event.**
- **Ideal judge backgrounds:**
 - Forensic science, criminal justice, CSI work, or law enforcement
 - Biology, chemistry, or lab-based sciences
 - Professionals familiar with chain-of-custody and investigative processes

Future Technology and Engineering Teacher – Judge Overview

- **What it is:**
Students assemble a detailed teaching portfolio—including research, a personal essay, a lesson plan aligned to ITEEA standards, and a hands-on activity—demonstrating their potential as future technology educators.
- **What judges do:**
Evaluate the portfolio for organization, clarity, standards alignment, and educational design quality. Semifinalists present their activity and answer questions about instructional decisions.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the submitted portfolio to choose the top 12 semifinalists.
 - **Semifinal Round:** Students deliver a **15-minute activity presentation** including setup, activity demo, Q&A, and cleanup.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Thoughtfully designed activities integrating STEM and technological literacy.
 - Lesson plans formatted with objectives, standards, assessments, and materials.
 - Students explaining instructional choices and teaching strategies.
 - **2025 saw 1 entry in this event.**
- **Ideal judge backgrounds:**
 - Technology & engineering education (TEED), STEM education, or curriculum design
 - K–12 educators, administrators, or instructional coaches
 - Industry trainers or professionals with teaching experience

Geospatial Technology – Judge Overview

- **What it is:**
Teams collect, analyze, and interpret geospatial data to address an annual theme. They submit a digital portfolio and an on-site visual infographic map, then semifinalists defend their projections in a presentation.
- **What judges do:**
Evaluate data collection, analysis accuracy, mapping quality, predictions, portfolio clarity, infographic design, and presentation responses.
- **Judging format:**
 - **Preliminary Round:** Judges score the digital portfolio to select the top 24, then score the infographic maps to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams complete a **10-minute presentation** including setup, presentation, and Q&A.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Maps, geospatial datasets, visualizations, and predictive modeling.
 - Student-produced infographics showing synthesized conclusions.
 - Strong analytical reasoning using GIS tools and geospatial concepts.
 - **2025 saw 0 entries in this event.**
- **Ideal judge backgrounds:**
 - GIS, geography, geospatial analysis, or environmental science
 - Data visualization, cartography, or urban planning
 - Research or analytics-focused STEM fields

Manufacturing Prototype – Judge Overview

- **What it is:**
High school teams design, document, CNC-manufacture, and assemble an original prototype that fits within a 7" cube and aligns with the annual theme. Students submit a full documentation portfolio and a completed, functional prototype for evaluation.
- **What judges do:**
Review component analysis, engineering drawings, photographs of the build process, and the finished prototype. Judges evaluate functionality, manufacturability, craftsmanship, use of required CIM/CNC processes, and clarity of documentation. Semifinalists present a short “sales pitch” demonstrating the product's value.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the prototype and the documentation portfolio to identify the top 24 entries, then score those portfolios to select the top 12 semifinalists.
 - **Semifinal Round:** Two team members deliver a **2-minute sales pitch** and answer questions about production cost, materials, and unit pricing.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Professionally produced engineering documentation packages
 - CNC-machined, laser-cut, or 3D-printed prototype components
 - A functional, finished promotional product built with at least two CNC/CIM processes
 - Short student presentations highlighting manufacturing processes and design decisions
 - **2025 saw 1 entries in this event.**
- **Ideal judge backgrounds:**
 - Mechanical engineering, manufacturing engineering, or industrial design
 - Experience with CNC machining, fabrication, 3D printing, CAD, or prototyping
 - Technical backgrounds in product design, manufacturing processes, or engineering documentation

Music Production – Judge Overview

- **What it is:**
Students compose and produce an original digitally mixed piece of music aligned to the annual theme. They also submit a documentation portfolio outlining their creative process, tools, and technical decisions.
- **What judges do:**
Evaluate the originality, audio quality, composition, mixing, thematic connection, and professionalism of the music track, along with the clarity and completeness of the documentation portfolio.
- **Judging format:**
 - **Preliminary Round:** Judges score the audio file to select the top 24, then score the documentation portfolios from those entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a **5-minute interview** discussing composition techniques, track structure, and production decisions.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fully mixed and mastered audio compositions created without vocals.
 - Detailed documentation showing digital workspace screenshots, track layers, and production notes.
 - Students explaining musical choices, sound design, and editing workflow.
 - **2025 saw 9 entries in this event.**
- **Ideal judge backgrounds:**
 - Music production, audio engineering, or sound design
 - Composition, mixing/mastering, or audio technology
 - Media arts or digital music education

On Demand Video – Judge Overview

- **What it is:**
Semifinalists create an original 2-minute video on-site within a 2-hour time window, based on a prompt revealed at the event. Teams must script, film, edit, and submit a complete video within the time limit.
- **What judges do:**
Evaluate creativity, storytelling, camera work, editing, sound, and technical execution under timed constraints. Judges also assess how well the final product aligns with the on-site prompt.
- **Judging format:**
 - **Preliminary Round:** No pre-submission; the event begins directly with the semifinal on-demand challenge.
 - **Semifinal Round:** Teams receive the prompt and have **2 hours** to film, edit, produce, and submit their final 2-minute video, followed by a short review by judges.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fast-paced filming environments with students running cameras, mics, and editing on-site.
 - Highly varied approaches to the same prompt.
 - Teams working creatively under strict timing and no outside assistance.
 - **2025 saw 8 entries in this event.**
- **Ideal judge backgrounds:**
 - Film/video production, editing, or broadcasting
 - Media arts, storytelling, or cinematography
 - Teachers or professionals experienced in timed creative work

Photographic Technology – Judge Overview

- **What it is:**
Students submit a portfolio of original photographs (based on an annual theme), complete an on-site photography challenge, and participate in an interview. Photos must be student-shot and edited.
- **What judges do:**
Evaluate composition, lighting, technical quality, creativity, adherence to theme, and the student's ability to explain their process during the interview.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the submitted photographic portfolio to identify the top 12 semifinalists.
 - **Semifinal Round:** Students complete an **on-site photo challenge**, submit images, and complete an interview.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Portfolios showcasing diverse photographic subjects and methods.
 - Students completing photography under real-world lighting/time constraints.
 - Discussion of composition, camera settings, and editing techniques.
 - **2025 saw 4 entries in this event.**
- **Ideal judge backgrounds:**
 - Photography (portrait, landscape, commercial, or artistic)
 - Photo editing, media arts, or visual design
 - Journalism or digital imaging

Prepared Presentation – Judge Overview

- **What it is:**
Students deliver a 2–3-minute prepared speech on the annual theme. Props and visual aids are not permitted; speeches must rely on delivery, clarity, and content.
- **What judges do:**
Evaluate organization, delivery, vocal quality, content accuracy, theme relevance, professionalism, and overall speech impact.
- **Judging format:**
 - **Preliminary Round:** Students deliver their prepared speech; judges score all contestants to identify the top 12 semifinalists.
 - **Semifinal Round:** Semifinalists repeat the same prepared speech.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Polished memorized speeches on STEM-related themes.
 - Strong focus on speaking skills, confidence, and professionalism.
 - No props, notes, or visuals allowed.
 - **2025 saw 16 entries in this event.**
- **Ideal judge backgrounds:**
 - Public speaking, communications, or debate
 - Business, leadership, or education
 - Professionals experienced in presentations or speech coaching

Promotional Design – Judge Overview

- **What it is:**
Students create a promotional design package—typically including a poster, logo, and supporting materials—aligned with an annual client brief. A documentation portfolio outlines the design process.
- **What judges do:**
Evaluate visual communication, branding cohesion, design creativity, technical quality, and the portfolio's clarity.
- **Judging format:**
 - **Preliminary Round:** Judges score the physical promotional design materials to select the top 24, then evaluate documentation portfolios to identify the top 12 semifinalists.
 - **Semifinal Round:** Students complete a **5-minute interview** explaining their branding decisions and design workflow.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Professionally designed posters, logos, and media packages.
 - Clear branding cohesion and typography choices.
 - Students discussing design inspiration, client needs, and revisions.
 - **2025 saw 6 entries in this event.**
- **Ideal judge backgrounds:**
 - Graphic design, visual communication, marketing, or branding
 - Advertising, illustration, or print production
 - UX/UI or digital media arts

Robotics – Judge Overview

- **What it is:**
Teams design, build, document, and test an open-source robot to complete the annual challenge. Robots undergo safety checks, timed tests, and a semifinal interview.
- **What judges do:**
Inspect robots for safety, evaluate performance in testing, score portfolios, and interview semifinal teams regarding design decisions and strategy.
- **Judging format:**
 - **Preliminary Round:** Teams complete setup; judges perform safety checks; robots test within a **30-minute** session. Top 16 testing scores advance to interviews.
 - **Semifinal Round:** Teams participate in a **10-minute interview**, with total rankings based on challenge score + testing + interview.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Custom-built robots using open-source components.
 - Busy pit environments with tools, repairs, and battery safety protocols.
 - Students explaining engineering choices, drivetrain decisions, and strategy.
 - **2025 saw 4 entries in this event.**
- **Ideal judge backgrounds:**
 - Robotics, mechatronics, electronics, or mechanical engineering
 - Programming, embedded systems, or drone/robot control
 - STEM educators familiar with robotics competitions

Senior Solar Sprint – Judge Overview

- **What it is:**
Students design, build, test, and race a solar-powered model car. They submit a documentation portfolio, model car, and decorated shoebox for static judging and racing evaluation.
- **What judges do:**
Evaluate portfolio quality, car construction, creativity, specification compliance, and race performance, as well as conduct semifinal interviews.
- **Judging format:**
 - **Preliminary Round:** Cars are inspected; all compliant models receive **two time trials**; fastest 16 advance. Documentation and display are also scored.
 - **Semifinal Round:** Teams complete a **5-minute interview**, then race in single or double elimination rounds.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Lightweight solar-powered model cars carrying ping-pong ball payloads.
 - Race excitement mixed with detailed engineering documentation.
 - Students explaining materials, gear ratios, testing, and design evolution.
 - **2025 saw 7 entries in this event.**
- **Ideal judge backgrounds:**
 - Mechanical or aerospace engineering
 - Physics, model aerodynamics, or solar energy
 - STEM educators or hobbyists experienced in model racing

Software Development – Judge Overview

- **What it is:**
Students design, develop, and document a software project that solves a problem connected to the annual theme. Executable code is submitted pre-conference, followed by a live presentation/interview.
- **What judges do:**
Evaluate functionality, code quality, user experience, problem-solving effectiveness, and the clarity of the presentation—plus ask a code-specific technical question.
- **Judging format:**
 - **Preliminary Round:** Students deliver a **7-minute presentation** with a **3-minute Q&A**. Judges evaluate the demo, code knowledge, and project value. Top 12 advance.
 - **Semifinal Round:** Same format as preliminary; judges determine finalists based on presentation and code understanding.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Projects built in any language or framework.
 - Students running demos offline with fallback plans for connectivity.
 - Clear discussion of design process, user needs, and technical decisions.
 - **2025 saw 0 entries in this event.**
- **Ideal judge backgrounds:**
 - Software engineering or computer science
 - Application development or UI/UX design
 - Data science, AI/ML, or systems architecture

STEM Mass Media – Judge Overview

- **What it is:**
Teams produce a 4-minute scientific news broadcast and documentation portfolio before the conference, then complete a semifinal press-conference interview and produce a 24-hour digital news article.
- **What judges do:**
Evaluate broadcast clarity, journalism quality, production value, accuracy, and documentation. Semifinalists are judged on interview questions and their written digital news story.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the video broadcast and documentation to select the top 12 semifinalists.
 - **Semifinal Round:** Teams complete a **10-minute briefing, 30-minute press conference, and 24-hour written article** submission.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - News broadcast segments with narration, visuals, and properly cited sources.
 - Professional-style press conference simulation.
 - Students producing a concise, accurate news article under time pressure.
 - **2025 saw 2 entries in this event.**
- **Ideal judge backgrounds:**
 - Journalism, broadcasting, or communications
 - Media production or public relations
 - Science outreach, reporting, or technical writing

Structural Design and Engineering – Judge Overview

- **What it is:**
Teams design, build, document, and test a lightweight structure to maximize efficiency (failure load vs. weight). Students submit a documentation portfolio and a pre-built structure, then semifinalists complete an on-site build-and-test challenge.
- **What judges do:**
Review documentation, inspect pre-built structures, observe destructive testing, and evaluate semifinalists' on-site construction, compliance, creativity, and understanding of engineering principles.
- **Judging format:**
 - **Preliminary Round:** Judges review portfolios and conduct destructive testing on all pre-built structures to identify the top 20 semifinalists.
 - **Semifinal Round:** Semifinalists complete a **3-hour on-site build**, followed by destructive testing and scoring of efficiency and subjective criteria.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Precision-built structures using lightweight materials such as wood.
 - Engineering drawings, on-site fabrication using hand tools, and destructive load testing.
 - Students applying real-world engineering principles like tension, compression, truss design, and efficiency.
 - **2025 saw 7 entries in this event.**
- **Ideal judge backgrounds:**
 - Civil, structural, architectural, or mechanical engineering
 - Construction engineering or materials science
 - Educators/industry professionals familiar with structural testing or model construction

System Control Technology – Judge Overview

- **What it is:**
Teams design and build a computer-controlled mechanical model that solves an industrial-style automation problem. They analyze the problem, build the model, program it, and demonstrate the solution to judges.
- **What judges do:**
Evaluate mechanical design, programming logic, problem interpretation, repeatability, model function, teamwork, and interview responses.
- **Judging format:**
 - **Three Phases:**
 1. **30 minutes** equipment setup
 2. **15 minutes** problem analysis
 3. **2 hours** model building, programming, and testing
 - **Interview:** Each team completes a **5-minute interview** after demonstrating their model.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Mechanical systems with sensors, motors, conveyors, switches, and programmed automation.
 - Teams troubleshooting under time pressure.
 - Detailed explanation of programming logic and mechanical functionality.
 - **2025 saw 0 entries in this event.**
- **Ideal judge backgrounds:**
 - Robotics, automation, mechatronics, or industrial engineering
 - Coding and embedded systems
 - STEM educators or professionals familiar with programmable control systems

Technology Bowl – Judge Overview

- **What it is:**
A written and oral quiz competition testing knowledge of STEM, TSA, and technology content standards. Students complete a written test first; top teams advance to a buzzer-based oral round.
- **What judges do:**
Manage buzzer rounds, read questions, track scoring, and ensure fairness.
- **Judging format:**
 - **Preliminary Round:** All teammates take a **1-hour written test**; scores are averaged to select top 16 semifinalists.
 - **Semifinal Round:** Bracket-style buzzer competition with timed responses and bonus questions.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fast-paced oral questioning similar to Quiz Bowl.
 - Students demonstrating leadership, communication, and quick recall.
 - Heavy emphasis on technology, STEM, engineering, and TSA knowledge.
 - **2025 saw 12 entries in this event.**
- **Ideal judge backgrounds:**
 - Educators in STEM, CTE, or general academics
 - Competition moderators, debate/speech coaches, or Quiz Bowl experience
 - Professionals familiar with technology and rapid-response evaluation

Technology Problem Solving – Judge Overview

- **What it is:**
Teams receive an on-site engineering challenge and have 90 minutes to design and build a functioning solution using only provided materials and hand tools.
- **What judges do:**
Evaluate build quality, creativity, problem-solving approach, teamwork, safety, rule compliance, and the quantitative performance of the solution.
- **Judging format:**
 - **On-Site Only:** 90 minutes for construction; testing occurs immediately afterward.
 - Performance is evaluated with an **objective measurement** (speed, distance, strength, accuracy, etc.).
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Creative engineering solutions built rapidly from limited materials.
 - Teams iterating, analyzing, and testing prototype ideas under pressure.
 - Clear quantitative results used to rank solutions.
 - **2025 saw 6 entries in this event.**
- **Ideal judge backgrounds:**
 - Engineering, physics, or problem-solving competitions
 - Hands-on technical fields or makerspace/fabrication experience
 - STEM educators

Transportation Modeling – Judge Overview

- **What it is:**
Students design, build, and document a scale vehicle model related to the annual theme. They submit a display, a detailed portfolio, and a handcrafted or CAD-modeled vehicle.
- **What judges do:**
Evaluate model craftsmanship, scale accuracy, design creativity, display quality, portfolio content, and semifinal interview responses.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the model and display to select the top 24, then score the documentation portfolios for the top 12 semifinalists.
 - **Semifinal Round:** Students complete a **5-minute interview**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Detailed scale vehicle models crafted from wood, foam, or 3D printing.
 - Multi-page documentation showing research, sketches, CAD work, and production photos.
 - Strong artistic and engineering elements in each design.
 - **2025 saw 1 entries in this event.**
- **Ideal judge backgrounds:**
 - Industrial design, automotive design, modeling, or mechanical engineering
 - CAD modeling or prototype fabrication
 - Product design or visual arts experience

Video Game Design – Judge Overview

- **What it is:**
Teams design, program, and document an original interactive video game based on the annual theme. They submit a playable online game, demo video, and PDF portfolio.
- **What judges do:**
Play and evaluate submitted games, review portfolios, assess demo videos, and conduct interviews with semifinalist teams.
- **Judging format:**
 - **Preliminary Round:** Judges score the game (first three levels), the demonstration video, and the documentation portfolio to determine the top 12 semifinalists.
 - **Semifinal Round:** A **10-minute interview** with two team representatives.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Playable games demonstrating art, mechanics, UI, scripting, and narrative.
 - Storyboards, code samples, licensing documentation, and game engines (Unity, Godot, etc.).
 - Highly creative interpretations of the annual theme.
 - **2025 saw 4 entries in this event.**
- **Ideal judge backgrounds:**
 - Game design, programming, animation, or digital art
 - UI/UX, software development, or interactive media
 - Educators or professionals familiar with narrative/game mechanics

Virtual Reality Simulation (VR) – Judge Overview

- **What it is:**
Students create a 2–3-minute VR simulation visualizing a STEM or technical concept using 3D graphics tools. They also prepare a complete documentation portfolio and present their simulation using VR hardware.
- **What judges do:**
Score the recorded VR simulation, review the documentation portfolio, and evaluate the on-site presentation and interview.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the simulation (Tier 1) and then the portfolio (Tier 2) to identify the top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a VR hardware presentation followed by a **4-minute interview**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - 3D animation, modeling, and visual storytelling.
 - VR content built in tools like Blender, Maya, Unity, etc.
 - Students explaining technical and aesthetic choices.
 - **2025 saw 0 entries in this event.**
- **Ideal judge backgrounds:**
 - 3D modeling, VR/AR development, animation, or game design
 - Digital media, visualization, or instructional design
 - Educators familiar with simulation or interactive media

Webmaster – Judge Overview

- **What it is:**
Teams design, build, and host a live website addressing the annual theme and design brief. Sites must include multiple pages, research content, references, and original design work.
- **What judges do:**
Review website functionality, content accuracy, navigation, design quality, adherence to theme, technical execution, citations, and accessibility.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the submitted website to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams complete a **10-minute interview** discussing design choices, research, workflow, and technical implementation.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fully functional websites using HTML/CSS/JS or modern frameworks.
 - Research-driven content related to the annual problem.
 - Clean UX, navigation, graphics, and responsive design.
 - **2025 saw 3 entries in this event.**
- **Ideal judge backgrounds:**
 - Web development, UI/UX design, or computer science
 - Graphic design or digital media
 - IT professionals or educators in web/tech fields

MS Audio Podcasting – Judge Overview

- **What it is:**
Middle school students create an original, theme-based audio podcast showcasing storytelling, scripting, sound mixing, and creative communication. They also submit a documentation portfolio outlining their planning, production workflow, copyright compliance, and editing decisions.
- **What judges do:**
Evaluate the podcast's clarity, audio quality, pacing, creativity, theme connection, technical execution, and portfolio completeness. Judges also assess semifinal on-site work.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate all podcast audio submissions to determine the top 24, then score the documentation portfolios of those entries to select the top 12 semifinalists.
 - **Semifinal Round:** Semifinalist teams receive an on-site prompt and have **36 hours** to produce an additional podcast segment for judging.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - A variety of creative audio formats (narrative, informational, comedic, interview-style, etc.).
 - Student-produced audio timelines, mixing layers, and script documentation.
 - Semifinal entries created under time constraints using student-provided equipment.
- **Ideal judge backgrounds:**
 - Audio engineering, music production, sound design, or broadcasting
 - Podcasting, voice work, or media production
 - Creative writing, communications, or storytelling fields
 - STEM educators familiar with digital media or audio projects

MS Biotechnology – Judge Overview

- **What it is:**
Middle school teams research a biotechnology issue connected to the annual theme and create a display, model, and documentation portfolio explaining impacts, scientific concepts, and proposed solutions. Semifinalists present their findings in a short interview.
- **What judges do:**
Evaluate the scientific accuracy, clarity of communication, creativity of the display/model, depth of research, and the quality of the documentation portfolio. Judges also assess student understanding during the semifinal interview.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the display/model and then the documentation portfolios of the top 24 entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Two team representatives deliver a **5-minute presentation** followed by a **5-minute Q&A**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Museum-style displays and optional models that visually explain biotechnology concepts.
 - Student-led research describing environmental, ethical, economic, or societal impacts.
 - Clear explanations of their proposed biotechnology solution.
- **Ideal judge backgrounds:**
 - Biology, biotechnology, biomedical or environmental sciences
 - Laboratory sciences, research, or STEM communication
 - Educators or professionals experienced in scientific analysis

MS CAD Foundations – Judge Overview

- **What it is:**
Students complete a 60-minute on-site CAD challenge demonstrating basic drafting and design skills. They create a set of 2D drawings or simple 3D models following industry standards.
- **What judges do:**
Evaluate accuracy, completeness, line work, dimensioning, use of standards, and the overall technical quality of the student's CAD drawings. Judges also consider how well the student follows the given prompt.
- **Judging format:**
 - **On-Site Event:** Students have **60 minutes** to complete the CAD challenge.
 - **Submission:** Students save and submit work as instructed for judges to evaluate.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - A quiet, technical work environment with students working independently.
 - CAD drawings that show foundational skills in orthographic projection, dimensioning, and layout.
 - A range of CAD software platforms (students bring their preferred tool).
- **Ideal judge backgrounds:**
 - Engineering graphics, drafting, CAD, or architecture
 - Mechanical or industrial engineering
 - Educators or professionals experienced in technical drawing standards

MS Career Prep – Judge Overview

- **What it is:**
Students prepare a professional resume, cover letter, and job application based on an assigned position. Semifinalists participate in a live interview with judges.
- **What judges do:**
Evaluate resume/cover letter quality, formatting, professionalism, grammar, completeness, and adherence to the job posting. Judges also assess communication skills during the semifinal interview.
- **Judging format:**
 - **Preliminary Round:** Judges score all submitted documents to determine the top 12 semifinalists.
 - **Semifinal Round:** Students participate in a **5-minute interview** simulating a real job interview.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Professionally formatted application materials written by middle school students.
 - A formal interview environment with structured questions.
 - Students demonstrating early workplace and communications skills.
- **Ideal judge backgrounds:**
 - Business, HR, workforce development, or administration
 - Educators or professionals familiar with hiring processes
 - Career counseling or professional development experts

MS Challenging Technology Issues – Judge Overview

- **What it is:**
Teams prepare arguments for both sides of a technology-related issue provided in advance. During the event, they deliver their viewpoints and answer judge questions in a structured discussion format.
- **What judges do:**
Evaluate clarity of arguments, organization, depth of research, teamwork, delivery, and the team's ability to respond thoughtfully during the discussion.
- **Judging format:**
 - **Semifinal Round Only:** Teams deliver a **5-minute prepared discussion** followed by a **5-minute Q&A**. There is no preliminary submission.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Students presenting both pro and con viewpoints.
 - Evidence-based arguments supported by research.
 - Professional and respectful discussion about emerging technologies.
- **Ideal judge backgrounds:**
 - Debate, public speaking, or communications
 - Technology fields or STEM education
 - Professionals who analyze or discuss policy, ethics, or technology impacts

MS Chapter Team – Judge Overview

- **What it is:**
Teams demonstrate parliamentary procedure skills by taking a written test and conducting a formal mock meeting using TSA-appropriate procedures.
- **What judges do:**
Evaluate written test scores, accuracy and professionalism during the meeting, correctness of motions, teamwork, officer roles, and the secretary's minutes.
- **Judging format:**
 - **Preliminary Round:** Teams take a **1-hour parliamentary procedure test**; top 12 average scores advance.
 - **Semifinal Round:** Teams conduct opening/closing ceremonies and process assigned motions within a timed session.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Formal presentations of parliamentary procedure.
 - Team coordination and role-specific responsibilities.
 - A structured, leadership-focused event.
- **Ideal judge backgrounds:**
 - Parliamentary procedure (Robert's Rules)
 - Leadership, meeting facilitation, or organizational governance
 - Speech/debate or student leadership advisors

MS Children's Stories – Judge Overview

- **What it is:**
Students write, illustrate, and produce an original children's storybook. They also submit a documentation portfolio describing their design and creation process. Semifinalists present their book.
- **What judges do:**
Score the book's narrative, illustrations, craftsmanship, originality, and alignment with the annual theme. Judges also evaluate the documentation and the semifinal presentation.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the storybook to select the top 24, then review documentation portfolios for those entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Students deliver a **5-minute presentation** followed by a **5-minute interview**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Illustrated, handmade children's books.
 - Story concepts tested with age-appropriate audiences.
 - Documentation showing sketches, drafts, and creative choices.
- **Ideal judge backgrounds:**
 - Elementary education, child development, or literacy
 - Illustration, graphic design, or creative writing
 - Library science or children's literature

MS Coding – Judge Overview

- **What it is:**
Teams complete a written coding exam, and semifinalists compete in a timed on-site programming challenge to create a working solution to a given problem.
- **What judges do:**
Score test results, evaluate on-site code functionality, assess correctness, efficiency, and clarity, and verify that the solution meets prompt requirements.
- **Judging format:**
 - **Preliminary Round:** Students take a **1-hour coding test**; top 24 advance to the portfolio scoring stage, and then the top 12 advance to semifinals.
 - **Semifinal Round:** Teams receive a prompt and have **2 hours** to code and submit a working program.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - A variety of programming languages (as allowed yearly).
 - Students coding independently under tight time limits.
 - Solutions ranked by correctness and efficiency.
- **Ideal judge backgrounds:**
 - Software engineering or programming
 - Competitive coding or algorithmic problem-solving
 - Computer science educators

MS Community Service Video – Judge Overview

- **What it is:**
Students produce a 2-minute video documenting their chapter's community service project. They also submit a portfolio detailing planning, execution, and project impact.
- **What judges do:**
Evaluate video content, storytelling, editing quality, community impact, and quality of documentation. Semifinalists deliver a brief presentation/interview.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the video and then score the documentation portfolios of the top 24 entries, narrowing to the top 12 semifinalists.
 - **Semifinal Round:** Students complete a **3-minute presentation** and **2-minute interview**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Videos documenting real service projects with measurable impact.
 - Documentation including photos, timelines, and community reflections.
 - Students describing their project outcomes and personal leadership growth.
- **Ideal judge backgrounds:**
 - Video production, media, or communications
 - Nonprofit, service learning, or community outreach
 - Educators familiar with project-based learning

MS Construction Challenge – Judge Overview

- **What it is:**
Students create a scale model/prototype, display, and documentation portfolio addressing an annual construction-related theme. Semifinalists deliver a presentation and interview.
- **What judges do:**
Evaluate the model/prototype, display, workmanship, feasibility, creativity, and portfolio quality. Judges also evaluate communication skills during the semifinal presentation.
- **Judging format:**
 - **Preliminary Round:** Judges review the model/prototype and display to identify the top 24, then evaluate documentation for the top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a **7-minute presentation** followed by a **3-minute Q&A**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Detailed scaled construction models, displays, and diagrams.
 - Portfolios showing sketches, materials lists, planning steps, and construction standards used.
 - Students explaining design decisions and how their solution meets the theme.
- **Ideal judge backgrounds:**
 - Construction, architecture, engineering, or industrial design
 - Model building, drafting, or fabrication
 - Educators or professionals experienced in project planning

MS Cybersecurity – Judge Overview

- **What it is:**
Students complete a cybersecurity knowledge test and, if selected as semifinalists, present a solution to an annual cybersecurity problem to a panel acting as a corporate board.
- **What judges do:**
Score technical understanding, clarity of explanation, real-world reasoning, use of data, presentation quality, and ability to answer security-related questions.
- **Judging format:**
 - **Preliminary Round:** Students take a **1-hour online test**; top 12 advance.
 - **Semifinal Round:** Students give a **3-minute presentation** and **2-minute Q&A** explaining the year's cybersecurity issue and recommended protections.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Presentations proposing security solutions using realistic metrics.
 - Students explaining trade-offs, vulnerabilities, and recommended controls.
 - Basic cybersecurity terminology and concepts.
- **Ideal judge backgrounds:**
 - Cybersecurity, IT, networking, or information systems
 - Digital forensics, security operations, or risk management
 - Professionals experienced in technical communication

MS Data Science and Analytics – Judge Overview

- **What it is:**
Teams analyze a provided dataset, research the annual topic, create a display, and develop a documentation portfolio explaining findings, ethics, impacts, and visualizations.
- **What judges do:**
Evaluate data analysis quality, accuracy of conclusions, clarity of graphs, thoroughness of research, organization of the display, and semifinal presentations.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate static displays to select top 24, then documentation portfolios to identify the top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a **5-minute presentation** followed by a **5-minute Q&A**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Graphs, statistical representations, and data interpretation.
 - Clear communication of issues, impacts, and solutions.
 - Visual displays explaining a real-world data-driven problem.
- **Ideal judge backgrounds:**
 - Data science, statistics, computer science, economics
 - Research, analytics, or STEM education
 - Professionals familiar with data visualization and scientific reasoning

MS Digital Photography – Judge Overview

- **What it is:**
Students submit a digital photography portfolio based on the annual theme. Semifinalists complete an on-site photography and editing challenge and then present their work.
- **What judges do:**
Evaluate composition, technical quality, creativity, theme adherence, editing skill, and clarity in the portfolio and semifinal presentation.
- **Judging format:**
 - **Preliminary Round:** Students submit a themed multi-page PDF portfolio; top 12 semifinalists are posted.
 - **Semifinal Round:** Students complete an on-site challenge (½-hour setup + **2-hour photography/editing**) and give a **2-minute presentation + 1-minute interview**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Original photos with both “original” and “edited” versions.
 - On-site shooting that matches a newly assigned prompt.
 - Detailed metadata and editing process descriptions.
- **Ideal judge backgrounds:**
 - Photography, digital media, journalism, or visual arts
 - Photo editing, design, or creative direction
 - Educators or professionals with artistic and technical expertise

MS Dragster – Judge Overview

- **What it is:**
Students design, build, document, and race a CO₂-powered dragster that meets strict specifications. They also produce a technical drawing and materials list.
- **What judges do:**
Evaluate spec compliance, construction quality, finish, technical drawings, race results, and interview responses.
- **Judging format:**
 - **Preliminary Round:** Judges inspect dragsters and drawings; legal cars race a qualifying time trial. Top 16 by time + spec compliance advance.
 - **Semifinal Round:** Top 16 participate in a **5-minute interview** and race in a double-elimination bracket.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Precision machining, sanding, shaping, and finishing.
 - Technical engineering drawings and materials documentation.
 - Fast-paced racing with strict safety and measurement standards.
- **Ideal judge backgrounds:**
 - Mechanical engineering, drafting, manufacturing, or automotive design
 - Model fabrication, woodworking, or aerodynamics
 - Educators familiar with engineering design

MS Drone Challenge – Judge Overview

- **What it is:**
Teams fly drones through scored manual-flight missions and submit a documentation portfolio explaining their research, theme application, and UAV understanding.
- **What judges do:**
Evaluate flight performance, model safety, portfolio quality, teamwork, and interview communication.
- **Judging format:**
 - **Preliminary Round:** Safety inspection → test flights → top 16 based on flight scores → documentation review → top 12 semifinalists.
 - **Semifinal Round: 10-minute interview** assessing understanding, design strategy, and mission approach.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Multiple 1-minute flight attempts per team member.
 - Safety gear requirements (glasses, vests).
 - Theme-based drone applications explained in the portfolio.
- **Ideal judge backgrounds:**
 - UAV/drone piloting, aerospace, or aviation
 - Robotics, engineering, or flight training
 - STEM educators with experience in flight systems

MS Electrical Applications – Judge Overview

- **What it is:**
Teams complete an electrical theory test, then semifinalists build and test a circuit from a schematic using their own components kit.
- **What judges do:**
Evaluate accuracy of test responses, correctness of circuit assembly, measurement skills, troubleshooting, and interview responses.
- **Judging format:**
 - **Preliminary Round:** Both team members take a **1-hour test**; average score determines top 12 semifinalists.
 - **Semifinal Round:** Teams have **1 hour** to build a circuit and take measurements, followed by an interview.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Breadboards, components, multimeters, and electrical schematics.
 - Students demonstrating electronics fundamentals under time constraints.
 - Team-based reasoning during the interview.
- **Ideal judge backgrounds:**
 - Electrical engineering, electronics, circuitry, or STEM labs
 - Technicians or hobbyists with circuit-building experience
 - Educators in physics or engineering

MS Flight – Judge Overview

- **What it is:**
Students design, document, and test a lightweight glider launched by a standardized catapult. They submit a documentation portfolio and compete in both pre-built and on-site construction rounds.
- **What judges do:**
Evaluate documentation portfolios, glider construction quality, compliance, and flight performance. Semifinalists rebuild their glider on-site for additional judged flights.
- **Judging format:**
 - **Preliminary Round:** Students get **4 official flights**; best three flights combined for score. Top 20 advance.
 - **Semifinal Round:** **45-minute glider construction + 10-minute trimming + 4 more flights** + portfolio scoring.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Engineering drawings, testing logs, and aerodynamic reasoning.
 - Flight attempts using TSA-provided catapults.
 - Safety eyewear and careful craftsmanship.
- **Ideal judge backgrounds:**
 - Aerospace engineering, physics, or aviation
 - Model aircraft building or aerodynamics
 - Educators with engineering design experience

MS Forensic Technology – Judge Overview

- **What it is:**
Teams take a forensic science written test and, if selected, demonstrate one of the posted forensic skills (e.g., fingerprinting, chromatography, trace evidence analysis) to judges.
- **What judges do:**
Evaluate technical accuracy, proper procedure, clarity of demonstration, and understanding of forensic science principles.
- **Judging format:**
 - **Preliminary Round:** Both members take a **1-hour test**; average score determines top 12 semifinalists.
 - **Semifinal Round:** **5 minutes** to set up, **7-minute demonstration**, **3-minute interview**, **3-minute cleanup**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Students performing lab-style, hands-on forensic techniques.
 - Independent execution — teams bring their own supplies.
 - Clear explanations of scientific method and evidence analysis.
- **Ideal judge backgrounds:**
 - Forensic science, laboratory science, or criminalistics
 - Law enforcement, crime scene technicians, or STEM educators
 - Professionals experienced in scientific demonstrations

MS Inventions and Innovations – Judge Overview

- **What it is:**
Teams identify a need and design an invention or innovation using mostly recycled materials. They create a model/prototype, a static display, and a semifinal sales-pitch presentation.
- **What judges do:**
Evaluate creativity, feasibility, use of recycled materials, display quality, model functionality or realism, and effectiveness of the sales pitch.
- **Judging format:**
 - **Preliminary Round:** Judges score the static display to select top 24, then evaluate the model/prototype to determine top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a **7-minute sales pitch + 2-minute Q&A** to judges acting as venture capitalists.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Creative models built with recycled materials.
 - Displays showing research, brainstorming, and development process.
 - Entrepreneur-style pitches explaining why the product matters.
- **Ideal judge backgrounds:**
 - Product design, entrepreneurship, engineering, or industrial design
 - Environmental science or sustainability
 - Educators familiar with innovation or STEM projects

MS Leadership Strategies – Judge Overview

- **What it is:**
Teams prepare and deliver a short, structured presentation in response to a leadership challenge commonly faced by TSA chapter officers. Students draw a prompt on-site, prepare for 15 minutes, and present for 3–5 minutes.
- **What judges do:**
Evaluate how effectively teams communicate solutions, apply leadership and 21st-century skills, organize ideas, stay within time limits, and respond to their chosen scenario.
- **Judging format:**
 - **Preliminary Round:** Teams draw three topic cards, choose one, prepare for **15 minutes**, and then deliver a **3–5 minute** presentation. Judges score independently; top 12 advance.
 - **Semifinal Round:** Same format with new topics and a fresh rubric.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Fast-paced teamwork under time pressure.
 - Students demonstrating leadership, problem solving, and communication.
 - Scenarios involving real chapter-management challenges.
- **Ideal judge backgrounds:**
 - Leadership development, education, advising, or coaching
 - Organizational management or team facilitation
 - Speech, communications, or student leadership programs

MS Mass Production – Judge Overview

- **What it is:**
Students design and manufacture a marketable product based on the annual theme. They produce three identical copies to demonstrate understanding of mass production, but submit one prototype and a detailed documentation portfolio.
- **What judges do:**
Evaluate craftsmanship, product design, manufacturability, documentation quality, and the team's understanding of the production process. Semifinalists present and answer questions.
- **Judging format:**
 - **Preliminary Round:** Judges score prototypes to select top 24, then evaluate documentation portfolios from those entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams deliver a **7-minute presentation** and a **2-minute Q&A**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Finished product prototypes with creativity and clear manufacturing intent.
 - Production plans, drawings, materials lists, and photo timelines.
 - Demonstrated understanding of efficient, repeatable manufacturing.
- **Ideal judge backgrounds:**
 - Manufacturing, industrial engineering, product design
 - Fabrication, machining, woodworking, or prototyping
 - STEM educators familiar with processes, planning, and documentation

MS Mechanical Engineering – Judge Overview

- **What it is:**
Students design and build a functional catapult according to an annual problem statement, demonstrating mechanical engineering concepts, subsystem design, and controlled performance testing.
- **What judges do:**
Inspect catapults for safety/compliance, assess performance during timed firing rounds, and evaluate engineering portfolios for teams that qualify for semifinals.
- **Judging format:**
 - **Preliminary Round:** Safety inspection, **3 minutes of practice**, then **2 minutes** to fire eight bags for scoring. Top performers have their portfolios judged.
 - **Semifinal Round:** Warm-up followed by a **1-minute shootout** of four bags.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - A wide range of catapult mechanisms and launching strategies.
 - Teams actively calibrating and solving mechanical issues.
 - Detailed engineering design portfolios and safety considerations.
- **Ideal judge backgrounds:**
 - Mechanical engineering, physics, robotics, or engineering design
 - Hands-on building, mechanics, or competitive engineering challenges
 - STEM educators with project-based learning experience

MS Medical Technology – Judge Overview

- **What it is:**
Teams research a medical technology tied to the annual theme and create a static display, informational pamphlet, and a multimedia video explaining the issue, solution, impacts, risks, and ethical considerations.
- **What judges do:**
Evaluate the display, pamphlet, and video for scientific accuracy, clarity, communication, design quality, and societal impact explanation. Semifinalists complete an interview.
- **Judging format:**
 - **Preliminary Round:** Judges score displays to select top 24, then evaluate pamphlets and videos from those entries to determine the top 12 semifinalists.
 - **Semifinal Round:** Teams participate in a **4-minute interview** (1-minute setup + 4-minute Q&A).
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Research-backed medical explanations and societal impact analysis.
 - Visual displays, QR-linked videos, and patient-oriented informational pamphlets.
 - Students communicating complex medical ideas in accessible ways.
- **Ideal judge backgrounds:**
 - Medical science, biomedical engineering, health sciences
 - Science communication or public health education
 - STEM educators with biology or healthcare expertise

MS Microcontroller Design – Judge Overview

- **What it is:**
Students design and program a functional digital device using a microcontroller that solves a real-world problem tied to the theme. They present the device, code, circuitry, and purpose.
- **What judges do:**
Evaluate functionality, coding, circuitry, design quality, portfolio documentation, and a timed live presentation with demonstration.
- **Judging format:**
 - **Single On-Site Presentation Round:** Students get **2 minutes setup, 3-minute presentation/demonstration, and 2 minutes cleanup.**
 - Judges evaluate the portfolio, device, and presentation to identify finalists.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Working electronic prototypes using Arduino, Raspberry Pi, or similar microcontrollers.
 - Source code, wiring diagrams, materials lists, and engineering logs.
 - Creative solutions with strong educational or social value.
- **Ideal judge backgrounds:**
 - Electronics, programming, embedded systems, robotics
 - Product design, prototyping, or engineering education
 - Anyone familiar with coding logic or circuit fundamentals

MS Off the Grid – Judge Overview

- **What it is:**
Students design a sustainable off-the-grid home or system for a specific country. They submit a display, physical model, and extensive documentation explaining climate-appropriate engineering and sustainability choices.
- **What judges do:**
Evaluate the display/model for clarity, accuracy, and design principles; assess documentation depth; and score semifinal presentations and Q&A.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate display + model to select top 24, then judge documentation portfolios from those entries to identify top 12 semifinalists.
 - **Semifinal Round:** Teams give a **7-minute presentation** and a **3-minute Q&A**.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Architectural and environmental engineering concepts adapted to specific countries.
 - Systems like solar arrays, water capture, thermal solutions, and waste management.
 - CAD drawings, sustainability research, and practical constraints such as budgets.
- **Ideal judge backgrounds:**
 - Architecture, civil/environmental engineering, or sustainability
 - Renewable energy, green building design, or environmental planning
 - STEM educators familiar with design briefs and research projects

MS Prepared Speech – Judge Overview

- **What it is:**
Students deliver a prepared speech (3–5 minutes) on the annual national theme, demonstrating clarity, speaking skill, organization, and confidence.
- **What judges do:**
Score delivery, content, pacing, organization, stage presence, and adherence to the theme. Both preliminary and semifinal rounds consist of live speeches.
- **Judging format:**
 - **Preliminary Round:** Judges score all speeches to select the top 12 semifinalists.
 - **Semifinal Round:** Students deliver their speeches again.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Student-written speeches tied directly to the year's theme.
 - No props, costumes, or multimedia—students rely solely on voice and presence.
 - Strict timekeeping and structured presentation order.
- **Ideal judge backgrounds:**
 - Public speaking, communications, leadership training
 - Debate, English/language arts, broadcasting
 - Professionals experienced in presentations or interviewing

MS Problem Solving – Judge Overview

- **What it is:**
Teams receive an on-site engineering challenge and must design and build a working solution in 90 minutes using only provided materials and items in their toolbox.
- **What judges do:**
Evaluate the final solution's performance using objective metrics (distance, strength, time, etc.) and ensure adherence to materials and safety guidelines.
- **Judging format:**
 - **On-Site Only:** Teams have **90 minutes** to design and build.
 - Solutions are tested immediately after construction, with performance fully determining ranking.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Rapid prototyping under pressure.
 - Creativity with limited materials and no external help.
 - Objective scoring based on measurable results.
- **Ideal judge backgrounds:**
 - Engineering, physics, STEM education
 - Makerspace, fabrication, prototyping
 - Problem-solving or design-thinking facilitation

MS Promotional Marketing – Judge Overview

- **What it is:**
Students create a full marketing portfolio—print advertisement, wearable design, and digital signage—based on the annual theme. Semifinalists also complete an on-site digital design challenge.
- **What judges do:**
Evaluate branding, visual design, communication effectiveness, originality, technical execution, and documentation. Semifinalists' on-site designs are judged independently.
- **Judging format:**
 - **Pre-Conference Submission:** Multi-page marketing portfolio PDF.
 - **Preliminary Round:** Judges select top 12 semifinalists.
 - **Semifinal Round:** Students complete a **1-hour on-site design challenge** using their own laptops.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Branding materials, digital media, advertising layouts, and design documentation.
 - Clear demonstration of marketing strategy tied to a theme.
 - On-site creativity under time constraints.
- **Ideal judge backgrounds:**
 - Graphic design, marketing, branding, advertising
 - Digital media, layout design, or illustration
 - Professionals with eye for visual communication

MS Robotics – Judge Overview

- **What it is:**
Students design, build, program, and test an open-source robot that completes a themed challenge. They set up pit areas, undergo safety checks, perform test runs, run the live challenge, and complete a semifinal interview.
- **What judges do:**
Evaluate robot safety, performance during the challenge, engineering decisions, teamwork, and clarity during the interview.
- **Judging format:**
 - **Preliminary Round:** Safety check → test session → challenge run. Top 16 gain a semifinal interview.
 - **Semifinal Round: 10-minute interview** assessing design, reasoning, and process.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Wide variety of robots using wheels, tracks, or custom mechanisms.
 - Structured pit areas with safety and inspection protocols.
 - Students actively diagnosing and improving robots.
- **Ideal judge backgrounds:**
 - Robotics, mechanical/electrical engineering, programming
 - Makerspace, FRC/VEX coaching, or engineering education
 - Anyone familiar with robot design, safety, and testing

MS Solar Racer – Judge Overview

- **What it is:**
Students design, build, and race a solar-powered model car, supported by a showcase display documenting their engineering process, testing, cost compliance, and solar performance evidence.
- **What judges do:**
Score the showcase display, evaluate the model car's specifications and safety, observe time trials, score head-to-head racing, and interview semifinalists.
- **Judging format:**
 - **Preliminary Round:** Specification check → up to two time trials → top 24 scored displays/models → racing bracket → top 12 semifinalists.
 - **Semifinal Round:** Teams complete a **5-minute interview**; judges combine all scores for final results.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Creative lightweight vehicle designs balancing mechanics, gear ratios, aerodynamics, and solar power.
 - Data logs, drawings, test results, and videos showing solar-only runs.
 - Exciting head-to-head indoor racing.
- **Ideal judge backgrounds:**
 - Mechanical engineering, automotive design, renewable energy
 - Physics, aerodynamics, or engineering technology
 - STEM educators familiar with design–test–iterate workflows

MS STEM Animation – Judge Overview

- **What it is:**
Students create a 3-minute (max) STEM-focused animated video using original graphics and audio, guided by an annual theme. They also produce a detailed documentation portfolio and, if selected, deliver a semifinal presentation.
- **What judges do:**
Evaluate the animation's clarity, creativity, technical execution, STEM communication, originality of assets, and the quality/completeness of the documentation portfolio. Semifinalists are also judged on their presentation and explanation of their workflow.
- **Judging format:**
 - **Preliminary Round:** Judges score the animation and full documentation portfolio submitted online by mid-May. Top 12 semifinalists are posted.
 - **Semifinal Round:** Teams give a **10-minute presentation** explaining design choices, research, storyboarding, and production processes.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Original animations—no purchased assets permitted.
 - Detailed storyboards, work logs, permissions documentation, and technical process notes.
 - Students explaining STEM concepts through visual storytelling.
- **Ideal judge backgrounds:**
 - Animation, digital media, film, or graphic design
 - STEM communication, instructional design, or science visualization
 - Professionals familiar with storyboarding and digital production workflows

MS Structural Engineering – Judge Overview

- **What it is:**
Students design, build, and document a lightweight structure that is destructively tested for efficiency. Pre-built structures are tested first; semifinalists then complete an on-site rapid-build challenge using provided materials.
- **What judges do:**
Evaluate documentation, dimensional compliance, construction quality, performance during destructive testing, and teamwork/process during the on-site build. Judges also score technical drawings and material lists.
- **Judging format:**
 - **Preliminary Round:** On-site destructive testing of pre-built structures + portfolio review → top 20 semifinalists.
 - **Semifinal Round: 3-hour construction challenge** → drying → destructive testing → subjective scoring.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Safety glasses required; precise measurement checks.
 - Highly inventive but rule-restricted structures using designated materials.
 - Public destructive testing of semifinal structures.
- **Ideal judge backgrounds:**
 - Civil/structural engineering, architecture, or construction science
 - Engineering education, model construction, or structural analysis
 - Anyone experienced with load-testing or structural design principles

MS System Control Technology – Judge Overview

- **What it is:**
Teams build and program a computer-controlled mechanical system that solves an industrial-style automation problem using sensors, motors, and their own materials kit.
- **What judges do:**
Assess the Inventor's Log, programming quality, mechanical design, problem analysis, model performance, and the team's interview responses.
- **Judging format:**
 - **Preliminary Round Only:**
 - 30-minute setup
 - 15-minute problem analysis
 - **2.5-hour build/program/test window**
 - Live demonstration for judges + interview
 - Judges evaluate models without teams present afterward.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Conveyor systems, automated sorting, industrial simulations.
 - Repeated testing for reliability, reset behavior, and sensor integration.
 - Inventor's Logs documenting design choices and activation instructions.
- **Ideal judge backgrounds:**
 - Robotics, automation, mechatronics, or industrial engineering
 - Computer science/programming
 - Educators or professionals familiar with control systems and sensors

MS Tech Bowl – Judge Overview

- **What it is:**
Teams take an individual written exam covering STEM concepts and TSA knowledge. Top teams advance to a fast-paced, buzzer-style oral competition.
- **What judges do:**
Score the oral competition by reading questions, tracking responses, timing, scoring point values, and ensuring correct procedure is followed.
- **Judging format:**
 - **Preliminary Round:** One-hour written exam; team score is the average of all three members. Top 16 advance.
 - **Semifinal Round:** Bracketed buzzer-round matches with strict timing and point scoring rules.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - High-energy competition with rapid recall.
 - STEM, technology, and TSA-history questions.
 - Judges moderating, scoring, and ensuring fairness.
- **Ideal judge backgrounds:**
 - STEM educators, quiz-bowl moderators, or academic coaches
 - Individuals comfortable with fast-paced scoring and rule enforcement
 - Professionals with strong general STEM knowledge

MS Technical Design – Judge Overview

- **What it is:**
A 24-hour engineering design challenge where teams create a full technical design portfolio—no prototype—using the design process loop (research, brainstorming, sketches, constraints, engineering drawings, evaluation).
- **What judges do:**
Evaluate interpretation of the design brief, brainstorming quality, clarity of sketches, engineering drawings, design logic, organization, and overall design process application.
- **Judging format:**
 - **Preliminary Round Only:** Teams receive the brief on-site → 24 hours to complete and submit a PDF portfolio → judges evaluate independently.
 - Top 10 finalists announced at awards.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Highly detailed portfolios containing sketches, pro/con lists, engineering drawings, and problem statements.
 - No physical model—evaluation is based entirely on design quality.
 - Clear demonstration of understanding of constraints and engineering reasoning.
- **Ideal judge backgrounds:**
 - Engineering design, drafting, architecture, or product development
 - STEM educators with experience teaching design processes
 - Professionals familiar with technical documentation

MS Video Game Design – Judge Overview

- **What it is:**
Teams develop a fully playable, original online video game with documentation showing design process, research, storyboard, controls, and copyright compliance. Semifinalists present and answer questions.
- **What judges do:**
Assess game mechanics, creativity, artwork, programming skill, usability, documentation quality, and the students' understanding during the interview.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the online game (first 3 levels), documentation portfolio, and optional bonus-point features.
 - **Semifinal Round: 5-minute presentation + 5-minute interview;** team may bring one charged device.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Playable browser-based games—no downloads allowed.
 - Storyboards, process videos, work logs, and permissions documentation.
 - A wide variety of game genres crafted for “E for Everyone.”
- **Ideal judge backgrounds:**
 - Game design, programming, animation, digital art
 - UI/UX, software development, or interactive media
 - Professionals familiar with playtesting and game balance

MS Website Design – Judge Overview

- **What it is:**
Students build a complete website responding to a design brief, including original layout, coding, media, references, and documentation. Semifinalists present their design choices and technical understanding.
- **What judges do:**
Evaluate site functionality, theme integration, originality, coding practices, layout, navigation, accessibility, supporting documentation, and quality of the semifinal interview.
- **Judging format:**
 - **Preliminary Round:** Judges evaluate the full website online; top 12 semifinalists advance.
 - **Semifinal Round: 5-minute presentation + 5-minute interview;** one device allowed, no projection.
 - **Judges are provided a clear scoring rubric and are asked to provide as much written feedback as possible so the students may improve their entry before the National Conference in the summer.**
- **What to expect:**
 - Multi-page hosted websites accessible year-round.
 - Work Logs, Copyright Checklists, and References page.
 - Custom-built frameworks or themes, not pre-made templates.
- **Ideal judge backgrounds:**
 - Web development, coding, UI/UX, or digital design
 - Graphic design, marketing, or front-end engineering
 - Educators or professionals with experience evaluating website usability