Below is a summary description of the 2018 and 2019 middle school level TSA competitive events. Detailed specifications and rules regarding each event can be found in the "TSA Middle School Competitive Events Guide for the 2018 and 2019 National TSA Conferences."

For applicable middle school events: You must use this updated Copyright Checklist for ALL competitions that require a checklist.

Biotechnology Participants (three [3] teams per state) conduct research on a contemporary biotechnology issue of their choosing, document their research, and create a display. The information gathered may be student-performed research or a re-creation or simulation of research performed by the scientific community. If appropriate, a model or prototype depicting some aspect of the issue may be included in the display. Semifinalist teams make a presentation and are interviewed about their topic.

CAD Foundations Participants (two [2] individuals per state) have the opportunity to demonstrate their understanding of CAD fundamentals as they create a two-dimensional (2D) graphic representation of an engineering part or object.

Career Prep Participants (one [1] individual per chapter) conduct research on a selected technology-related career according to a theme posted on the TSA website, and use this knowledge to prepare a letter of introduction and a chronological skills resume. Semifinalists participate in a mock interview.

Challenging Technology Issues Participants (three [3] teams of two [2] individuals per state) work together to prepare and deliver a debate-style presentation with participants explaining opposing views of a current technology issue. The current year's topics will be posted on Themes and Problems.

Chapter Team Participants (one [1] team of six [6] individuals per chapter) take a written parliamentary procedures test in order to qualify for the semifinals, in which they complete an opening ceremony, items of business, parliamentary actions, and a closing ceremony within a specified time period.

Children's Stories Participants (three [3] teams per state; a team of one (1) is permitted) create an illustrated children's story that will incorporate educational and social values. The story may be written in a genre of choice. Examples are fables, adventures, non-fiction, fiction, and fairy tales. The story must revolve around the theme chosen for the given year. The theme will be posted on Themes and Problems.

Coding Participants (one [1] team of two [2] members per chapter) will demonstrate their knowledge of computer science and coding by taking a written test. Semifinalists will further demonstrate their programming knowledge by participating in an onsite programming challenge. Details about the onsite challenge (e.g., programming language to be used and practice problems) can be found on Themes and Problems.

Community Service Video Participants (one [1] team per chapter; entries may be submitted by an individual or group) create and submit a video that depicts the local TSA chapter's service with the American Cancer Society, national TSA's community service partner.

Construction Challenge Participants (one [1] team per chapter) submit a scale model/prototype with a portfolio that documents the use of their leadership and technical skills to fulfill an identified community need related to construction. Semifinalists discuss their projects in a presentation and an interview.

Digital Photography Participants (three [3] individuals per state) produce a digital album consisting of color or black and white digital photographs that represent or relate to a chosen theme posted on Themes and Problems and place the album on a storage device

(USB flash drive) for submission. Semifinalists produce a series of digital photographs taken at the conference site that are edited appropriately for the onsite task. Details about the correct year's theme can be found on Themes and Problems.

Dragster Participants (two [2] individuals per chapter; one [1] entry per individual) design and produce a race-worthy CO2-powered dragster according to stated specifications, using only specified materials. Special design requirements will be posted on Themes and Problems.

Electrical Applications Participants (one [1] team of two [2] individuals per chapter) take a written test of basic electrical and electronic theory. Semifinalists assemble a specific circuit from a schematic diagram using their own kit and make required electrical measurements, and explain their solution during an interview.

Essays on Technology Participants (three [3] individuals per state) conduct research on specified subtopics of a broader technological area and, using the knowledge and resources gained through that research, write a comprehensive essay on one subtopic that is designated onsite.

Flight Participants (two [2] individuals per chapter; one [1] entry per individual) study the principles of flight and design in order to fabricate a glider that stays in flight for the greatest elapsed time. The glider must be designed to be launched from a catapult that is provided onsite. The design process is documented in a portfolio that is submitted for evaluation.

Forensic Technology Participants (one [1] team of two [2] individuals per chapter) take a written test of basic forensic science theory to qualify as semifinalists. Semifinalists demonstrate their ability to use forensic technology and skills by collecting evidence from – and analyzing – a mock crime scene.

Inventions and Innovations Participants (one [1] team of at least

three [3] individuals per chapter; one [1] entry per team) investigate and determine the need for an invention or innovation of a device, system, or process, and then brainstorm ideas for a possible solution. Semifinalists make an oral presentation to a panel of judges (who act as venture capitalist investors) to persuade the panel to invest in their invention/innovation.

Junior Solar Sprint (JSS) Participants (one [1] team of two to four [2-4] per chapter, one [1] entry per team) apply STEM concepts, creativity, teamwork, and problem-solving skills as they design, construct, and race a solar-powered model car.

Leadership Strategies Participants (one [1] team of three [3] individuals per chapter) demonstrate leadership and team skills by preparing a presentation based on a selected challenge the officers of a TSA chapter might encounter.

Mass Production Participants (one [1] team of at least two [2] individuals) manufacture a marketable product related to the current year's theme, which can be found on Themes and Problems. The team submits a documentation portfolio of the activities involved and three identical products made during the manufacturing process.

Mechanical Engineering Participants (one [1] team of three to six [3-6] individuals per chapter; one [1] entry per team) will design and build a "Rube Goldberg" mechanical device. This device will contain three (3) subsystems within a larger system. Each subsystem will contain all six (6) simple machines in a fun and inventive way. The final solution or grand finale is open-ended to maximize creativity. The transfer of energy in a device will travel a specific path from start to finish for a minimum of seven(7) seconds per board. The device must be self-powered utilizing kinetic energy. The device must be capable of repeated demonstrations without long setup times. Semifinalists participate in a presentation interview.

Medical Technology Participants (three [3] teams of at least two [2] individuals per state; one [1] entry per team) conduct research on a

contemporary medical technology issue of their choosing, document their research, and create a display. If appropriate, a model or prototype depicting an aspect of the issue may be included in the display. Semifinalists give a presentation.

Microcontroller Design Participants (one [1] team of three to five [3-5] individuals per chapter) develop a working digital device (product) with real-world applications. Through a multimedia presentation, product demonstration, and documentation, the team demonstrates in detail its knowledge of microcontroller programming, simple circuitry, and product design and marketing. The project should have educational and social value, and conform to the theme for the year. The theme will be posted on Themes and Problems. Teams demonstrate and promote their work in a timed presentation.

Off the Grid Throughout the world, people are working to become more self-sustaining when it comes to landscaping and architectural design. Sometimes the purpose is to live off the grid, and other times it is to create a smaller carbon footprint. There are many options throughout the world, but sometimes a location limits or enables those options. In this event, participants conduct research on a sustainable architectural design for a home in a country of the team's choosing (other than their home country). Participants (three [3] teams per state) will create a display and a model. The model can be of the home the team designed or of a specific aspect of their design. Semifinalist teams will give a presentation and are interviewed about their design. The design brief for this competition will be posted on Themes and Problems.

Prepared Speech Participants (three [3] individuals per state) deliver a speech that reflects the theme of the current year’s national conference.

Problem Solving Participants (one team of two individuals per chapter) use problem solving skills to develop a finite solution to a problem provided onsite.

Promotional Marketing Participants (one [1] individual per chapter; one (1) entry each) create marketing tools that could be used in a TSA Promotional Kit. The theme and required elements for this event will be posted on Themes and Problems. The toolkit components will be digitally submitted on a USB flash drive in an envelope, both labeled with the student's identification number. Semifinalists are asked to work creatively under constraints to design a solution to a problem given onsite, using their own computer/laptop work station. Semifinalist entries will be saved to the individual's event USB drive for judging.

STEM Animation Participants (three [3] teams per state; one [1] entry per team) use computer graphics tools and design processes (i.e., animation) to communicate, inform, analyze and/or illustrate a topic, idea, subject, or concept that focuses on one (1) or more of the following areas: science, technology, engineering, or mathematics; sound may accompany graphic images. Participants will find the current year's theme posted on Themes and Problems. A documentation portfolio and a USB flash drive with the STEM animation comprise the entry. Semifinalists make a presentation.

Structural Engineering Participants (one [1] team of two [2] individuals per chapter may participate, one [1] entry per team) apply the principles of structural design and engineering through basic research, design, construction, and destructive testing to determine the design efficiency of a structure. Details about the structure and information related to it will be posted on the TSA website under Themes and Problems. The onsite semifinalist problem will be a variation of the pre-conference problem posted on TSAweb.org.

System Control Technology Participants(one [1] team of three [3] individuals per state may participate, one [1)] entry per team) use a team approach to develop a computer-controlled model solution to a given problem, typically one based on an industrial setting. Teams analyze the problem, build a computer-controlled mechanical model, program the model, explain the program and mechanical features of the model-solution, and leave instructions for judges to operate the

device.

Tech Bowl Participants (one [1] team of three [3] individuals per chapter) demonstrate their knowledge of TSA and concepts addressed in the technology content standards by completing a written objective test; semifinalist teams participate in a question/response, head-to-head competition.

Technical Design Participants (one [1] team of two [2] individuals per chapter) demonstrate their ability to use the technical design process to solve an engineering design problem onsite at the conference.

Video Game Design Participants (one [1] team of two to six [2-6] individuals per chapter; one [1] entry per team) develop, build, and launch an E-rated, online game that focuses on the subject of their choice. The game should be interesting, exciting, visually appealing, and intellectually challenging. The game and all required documentation must be submitted—and will be evaluated—online, pre-conference. Semifinalist teams (list posted at the conference) participate in an onsite interview to demonstrate the knowledge and expertise they gained during the development of the game.

Website Design Participants (one [1] team of three to six [3-6] individuals per chapter; one entry per team) design, build, and launch a website that features the team's ability to incorporate the elements of website design, graphic layout, and proper coding techniques. The design brief for this event will be posted on Themes and Problems. Semifinalists (determined prior to the conference) participate in an onsite conference interview, with an emphasis on web design as it pertains to their solution, to demonstrate the knowledge and expertise gained during the development of the website.