Tuesday, October 16, 2018

Dear TSA Advisors and Technology, Engineering and Design Teachers,

Attached is the tentative schedule for the Eastern Region NC TSA Conference, to be held on the campus of Wayne Community College on Friday, February 7, 2020

All TSA chapters including Guilford County and west are encouraged to attend. Schools from these regions that are interested in starting a TSA chapter are also encouraged to participate as well.

I am also attaching the event information, A TENTATIVE SCHEDULE, registration link and the medical/photo release form. Please make sure that you turn in the medical/photo release form when you check-in at registration. **This year we are asking that each school provide at least ONE COORDINATOR (Two are preferred) for this event. Registration will open on December 18, 2019.**

Please note that some of the events will operate **differently** than described in the TSA Competitive Events Guides. Due to time constraints, some events that normally involve on-site construction of projects will deviate from the event guidelines.

Costs:
Student Registration: $15.00 (includes lunch and a shirt)
Advisor Registration: $10.00 (includes lunch and a shirt)
Chaperone Registration: free (includes lunch)

As many of you know, weather in North Carolina is naturally unpredictable. If Wayne Community College is closed or if the roads are deemed unsafe by the event coordinator, the event may be delayed or canceled. If the conference is canceled, then schools will receive a maximum of a 50% refund. Refunds will not be given to schools that decide not to attend due to weather or any other unforeseen events. *There will be no on-site registration*. Schools facing financial hardships should reach out to Dr. Taylor for assistance.

We can only *guarantee* spaces in events to those schools/students that have **pre-registered by January 24th.** Payment should be postmarked no later than **February 1, 2020.** Failure to submit payment prior to the conference will result in elimination from the event.

For additional information about the events, contact the event coordinator, Jerianne Taylor (Jerianne.taylor@dpi.nc.gov), via phone or email.

We look forward to seeing you on February 7th.

Sincerely,

Jerianne S. Taylor

Jerianne Taylor, EdD, DTE
NC TSA Executive Director and State Advisor
Professor & Career & Technical Education Program Director
Appalachian State University
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PERSONAL LIABILITY RELEASE FORM

North Carolina Technology Student Association
2020 Regional Competitive Events Conference
February 7, 2020
Wayne Community College

Name of Student Participant:

Name of School: Advisor:

NOTE: EVERY STUDENT MUST HAVE A COPY OF THIS FORM SIGNED BY PARENT OR GUARDIAN IN ORDER TO PARTICIPATE.

I hereby agree to release Wayne Community College and the North Carolina Technology Student Association, Inc., its representatives, agents, servants, and employees from liability for any injury to the above named person, resulting from any cause whatsoever occurring to the above named person at any time while attending the North Carolina Technology Student Association Eastern Region Conference, including travel to and from the conference, excepting only such injury or damage resulting from willful acts of such representatives, agents, servants and employees.

I do voluntarily authorize the North Carolina Technology Student Association's Eastern Region Conference Chair, assistants and/or designee to administer and/or obtain routine or emergency diagnostic procedures and/or routine or emergency medical treatment for the above named person as deemed necessary in medical judgment.

I agree to indemnify and hold harmless the North Carolina Technology Student Association, Inc., Wayne Community College, said medical service coordinator and/or assistants and designees from any and all claims, demands, actions, or rights of action, on account of said procedures and/or treatment rendered in good faith and according to accepted medical standards.

Having read and understood completely the "Student Code of Conduct" for the North Carolina Technology Student Association, Inc., I do hereby agree to follow the conduct described. I fully understand that this is an educational activity and will, to the best of my ability, apply myself for the purpose of learning and will uphold at all times the good qualities of a person representing the North Carolina Technology Student Association, Inc.

_____ _____
Participant Date

_____ _____
Parent or Guardian Date

PUBLICITY: I agree to allow pictures of my child from this conference to be used for NC TSA and Lenoir Community College promotional purposes.

_____ _____
Parent or Guardian Date

☐ **I DO NOT** give NCTSA the right to collect self- reported data that will be used for educational purposes only, from my child.

Participants: please bring a signed copy of this form to the Conference

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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 *2019 & 2020 Middle School Technology Activities, National TSA Conference Competitive Events Guide.*

Biotechnology Participants **(five [5] teams per chapter)** 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. Top 5 Semifinalist teams make a presentation and are interviewed about their topic.

Career Prep: Participants **(four individuals per chapter)** conduct research on a selected technology-related career and use the knowledge gained to prepare a letter of introduction and a chronological skills resume. Top 5 Semifinalists participate in a mock interview.

In 2020, students choose one (1) of these careers:

- Manufacturing
- Marketing, Sales, & Service
- Agriculture, Food, and Natural Resources
- Education and Training

Children's Stories: Participants **(five teams per chapter; a team of one individual is permitted)** create an illustrated children's story that will incorporate educational and social values. The story must revolve around the theme for a given year that is posted on the TSA website. Top 5 semifinalists will present their stories to the judges.

Theme: Pop-Up STEM Book
Choose one of the following themes for your pop-up book:

1. Communicate how increases in human population and consumption of natural resources impact Earth's systems.
2. Discusses the rise in global temperatures over the past century.
3. Describe or give an example of how synthetic materials come from natural resources.

Coding Participants **(two [2] teams 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 on-site programming challenge. Details about the on-site challenge (e.g., programming language to be used and practice problems) can be found on the TSA website under Themes and Problems.

Scratch is a free visual programming language available from the MIT Media Lab (https://scratch.mit.edu/starter_projects/). An offline version of the Scratch tool should be downloaded and available on each team's laptop.

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Construction Challenge: Participants **(five teams 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. *Top Five Semifinalists will be interviewed.*

Digital Photography: Participants **(three individuals per chapter)** produce an album of color or black and white digital photographs (representing or relating to a chosen theme) and place the album on a storage device for submission. Semifinalists produce a series of digital photographs taken at the conference that are edited appropriately for an on-site task. *No on-site problem.*

Theme: "Nature (5 photos)"

Dragster: Participants **(five individuals per chapter; one entry per individual)** design and produce a CO2 powered dragster according to stated specifications, using only specified materials.

Flight: Participants **(five individuals per chapter, one entry each)** study the principles of flight and design in order to fabricate a glider that stays in flight for the greatest elapsed time. Flight duration of the gliders and documentation of the design process are the primary elements of evaluation.

Inventions and Innovations: Participants **(five teams of at least three individuals per chapter; one 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. Top 5 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.

Theme: Today society moves at a faster pace than ever before. We are always on the move. This year's theme is for a mobile device to make everyday life on the go easier to handle.

Junior Solar Sprint: Participants **(five teams per chapter, one entry per team)** apply STEM concepts, creativity, teamwork, and problem-solving skills as they design, construct, and race a solar-powered model car.

Mass Production Participants **(five [5] teams 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. *No Onsite Presentations or Interviews.*

Theme: An organizer for a teacher's desk.

Mechanical Engineering Participants **(two [2] teams 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. *Top Five Semifinalists will be interviewed.*

Theme: Teams will design and build a "Rube Goldberg" mechanical device. This device will contain four (4) subsystems that when combined make up a larger system. Each subsystem will contain four (4) simple machines in a fun and inventive way. Each type of simple machine must be used at least twice across the complete system (all four subsystems). The transfer of energy in the 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 after the initial touch that starts the device. The device must be capable of repeating demonstrations with the reset time for the entire system to be less than 3 minutes. The size of each sub system must not exceed 12" wide x 12" deep x 18" tall. The entire system must fit within an area of 24" wide x 24" deep x 18" tall. Each subsystem should be self-contained to its own 12"x12" base made from a material of your choice (please refer to the attached diagram for a visual reference).

Medical Technology: Participants **(three teams of at least two individuals per chapter; one 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. *No Onsite Presentations or Interviews.*

Microcontroller Design Participants (one [1] team per chapter; a team of one (1) is permitted) develop a working digital device (product) with real-world applications. Through a product demonstration and documentation, the team demonstrates 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, which can be found on Themes and Problems. Semifinalists demonstrate and promote their work in a presentation.

Theme: Prototype Laser Game

Off the Grid Participants **(five [5] teams per chapter; a team of one (1) is permitted**) conduct research on a sustainable architectural design for a home in a country of the team's choosing (other than their home country), and document their findings in a display and a model. The model can be of the home designed by the team, or of a specific aspect of their design. Semifinalist teams give a presentation and are interviewed about their design. The design brief can be found on the Themes and Problems page.

Theme: Design a home for a family of four (4) in a country that is classified as a developing economy

Prepared Speech: Participants **(three individuals per chapter)** deliver a speech that reflects the theme of the current year's national conference.

Theme: Inspire A Shared Vision

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

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Promotional Marketing: Participants **(five individuals per chapter, one entry per individual)** design a three-part **TSA Marketing Toolkit** that must include:

You should approach your design with the following scenario in mind: You are inviting participants to attend a fictitious special interest session at the National TSA Conference that discusses how technologies can mitigate the effects of minimizing human impacts on the environment. Fake names must be used for the special interest presenters and any affiliated organizations (i.e., if using an organization for example, PETA, use "Organization for Animal Ethics" or another fake name).

1. Printable: a tri-fold brochure advertising the special interest session.
2. Wearable: a T-shirt that promotes minimizing human impacts on the environment
3. Digital Signage: to be displayed in the lobby of the Gaylord that promotes this theme.

No on-site problem.

Structural Engineering: Participants **(five teams of two individuals per chapter)** apply the principles of structural design and engineering through basic research, design, construction, and destructive testing to determine the design efficiency of a structure. *No on-site construction.*

Please click here for the problem statement.
MS Structural Engineering Analysis and Assessment Form
MS Structural Engineering Verification form

Tech Bowl: Participants **(one team of three individuals per chapter)** take a written objective examination to qualify for the oral question/response, head-to-head team competition phase of the event.

Website Design: Participants **(three teams of three to six 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. *No on-site interview.*

Link to 2019 Challenge: http://tsaweb.org/Themes-and-Problems

To submit your URL, please use this link:
https://goo.gl/forms/Vcp5BIfxtGbLJ6Df2

Be sure to submit your URL on or before 11:59 PM on February 6, 2019.

Be sure to refer to the following site for competition updates for any changes to the events:
http://www.tsaweb.org/Competition•Updates

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Wayne Community College

Below is a summary description of the 2020 and 2021HIGH school level TSA competitive events. Detailed specifications and rules regarding each event can be found in the 2020 & 2021 High School Technology Activities, National TSA Conference Competitive Events Guide.

Animatronics Participants **(five [5] team per chapter)** demonstrate knowledge of mechanical and control systems by designing, fabricating, and controlling an animatronics device that will communicate, entertain, inform, demonstrate and/or illustrate a topic, idea, subject, or concept. Sound, lights, and a surrounding environment must accompany the device.

Theme: Create an Animatronic exhibit for a national park

Architectural Design: Participants **(five teams, or one individual, per chapter; one entry per team or individual)** develop a set of architectural plans and related materials for an annual architectural design challenge and construct a physical, as well as a computer-generated model, to accurately depict their design.

Biotechnology Design Participants (Five [5] teams or individual per chapter) select a contemporary biotechnology problem that reflects the theme for the year, which can be found on Themes and Problems. Participants demonstrate understanding of the topic through documented research, the development of a solution, a display (including an optional model or prototype), and an effective multimedia presentation.

Board Game Design Participants (five [5] teams per chapter) develop, build, and package a board game that focuses on the subject of their choice. The game should be interesting, exciting, visually appealing, and intellectually challenging. Each team will have to design the packaging, instructions, pieces, and cards associated with creating and piloting a new board game. Top 5 Semifinalists for the event will set up the game, demonstrate how the game is played, and explain the game's features.

Computer-Aided Design (CAD), Architecture Participants (two [2] individuals per chapter) use complex computer graphic skills, tools, and processes to develop representations of architectural subjects, such as foundation and/or floor plans, and/or elevation drawings, and/or details of architectural ornamentation or cabinetry.

Computer-Aided Design (CAD), Engineering Participants (two [2] individuals per chapter) use complex computer graphic skills, tools, and processes to develop three-dimensional representations of engineering subjects such as a machine part, tool, device, or manufactured product.

Children's Stories: Participants **(five teams per chapter; a team of one individual is permitted)** create an illustrated children's story of high artistic, instructional, and social value. The narrative may be written in prose or poetry and take the form of a fable, adventure story, or other structure. The physical storybook should be of high quality and designed to meet the year's given theme. The story must have a science, technology, engineering, and mathematics (STEM) focus. Top 5 semifinalists will read their stories to the judges.

Theme: Design a "choose your own adventure" book for children ages 5-8

Coding: Participants **(two (2) individuals, or two (2) teams of two to three (2-3) members).** Participants respond to an annual coding-related design challenge by developing a software program that will accurately address an on-site problem in a specified, limited amount of time. Specific elements to be used, such as the programming language, operating system, or application programming interface (API), will be released on-site. Completed solutions will be objectively measured to determine the best and most effective solution for the stated problem.

Computer Integrated Manufacturing (CIM): Participants **(five teams of two members per chapter)** design, fabricate, and use Computer Integrated Manufacturing (CIM) to create a promotional TSA product that will showcase the current conference city and/or state.

Theme: Students will design and create an original model of one of the simple machines that a teacher can use for a demonstration in class . All designs must be the original work of the students. Pre-made kits and designs will be disqualified. The final product will need to showcase the current conference city and state.

Digital Video Production: Participants **(five teams per chapter, one entry per team)** develop a public service announcement and a digital video (with sound) that focuses on the given year's theme.

Theme: A Mystery Film.

Dragster Design: Participants **(five individuals per chapter, one entry per individual)** design, produce working drawings for, and build a CO2-powered dragster. *No Interviews.*

For 2019 ONLY: The dragster body must include at least one (1) wing, spoiler, fin or splitter as part of the finished product. It must be part of the one-piece body, not an add-on or additional piece, and must stay within all other regulated specifications as outlined in the event regulations

Engineering Design: Participants **(five teams of three to five individuals per chapter, one entry per team)** develop a solution to a National Academy of Engineering grand challenge that is posted on the national TSA website. The solution offered will be informed and designed by precise problem definition, thorough research, creativity, experimentation (when possible), and the development of documents and appropriate models (mathematical, graphical, and/or physical prototype/model). Semifinalists justify and demonstrate their solution in a timed presentation.

Theme: Identify a need in a developing country and design a project that will empower that community to meet basic human needs (for ideas, check out: Engineers Without Borders and other similar organizations that are helping people build better, safer communities).

Flight Endurance: Participants **(five individuals per chapter, one entry per individual)** analyze flight principles with a rubber band-powered model aircraft.

Future Technology Teacher: Participants **(three individuals per chapter)** research and select three accredited colleges or universities that offer technology education teacher preparation as a major. Each participant writes a one page simulated college essay explaining why he/she would like to become a technology educator and what would constitute success in the field. Participants also develop and present a lesson plan to judges. Top 5 Semifinalists will present their lessons to the judges.

Photographic Technology: Participants **(five individuals per chapter)** capture and process photographic and digital prints that depict the current year's published theme. Semifinalists participate in an on-site event in which they capture digital images and utilize multimedia software to prepare and develop a media presentation during the annual conference. *No On-Site Problem.*

This year participants have the opportunity to show their photography skills working with different lighting conditions. Participants must create a portfolio featuring five (5) pictures. Please note that picture #1 must contain people and/or animals. All other pictures may or may not have people or animals in them. Make sure to read the event rules for further directions.

This year participants have the opportunity to show their photography skills taking action photos. Participants must create a portfolio featuring five (5) pictures at local sporting events. The events must be sporting events found in the 2020 Summer Olympics.
Note: Picture #1 must contain people and/or animals. All other pictures may or may not have people or animals in them. Make sure to read the event rules for further directions.
Pictures #1 & 2: Color picture taken during the day of a sporting event (can be indoors).
Picture #3: Color picture taken at night of a sporting event (must be outdoors).
Picture #4: Black and white picture of a sporting event
Picture #5: Student choice as to whether it is color or black and white, however, the picture must involve a slow shutter speed (you must provide the shutter speed it was shot at), and must be of a sporting event.

Prepared Presentation: Participants **(three individuals per chapter)** deliver an oral presentation that includes a visual enhancement, based on the theme for the current year's conference.

Promotional Design: Participants **(five individuals per chapter, one entry each)** develop and submit electronically a graphic design that can be used to promote participation in TSA-related interests.

Structural Design and Engineering: Participants **(five teams of two individuals per chapter, one entry per team)** work as part of a team to build a structure that is posted on the TSA website. The structure is destructively tested and assessed to determine design efficiency.

Please click here for the problem statement.
Please click here for the storage box plan drawing.
HS Structural Team Verification and Analysis Form

No On-site Problem.

Technology Bowl: Participants **(two teams of three individuals per chapter)** complete a written, objective test in order to qualify for oral question/response, head-to-head team competition.

Technology Problem Solving: Participants **(two teams of two individuals per chapter)** work together on site to develop and create a solution to a problem using the limited materials provided and the tools allowed.

Transportation Modeling: Participants **(five individuals per chapter, one entry per individual)** design and produce a scale model of a vehicle that fits the annual design problem.

Theme: A manned surface exploration vehicle for the Moon or Mars. Consideration must be shown or explained regarding how the vehicle will be transported and assembled at the destination**.**

Webmaster: Participants **(five teams of three to five individuals per chapter)** are required to design, build, and launch a website that features their school's career and technology/engineering program, the TSA chapter, and the chapter's ability to research and present a given topic pertaining to technology. Semifinalists participate in an on-site interview to demonstrate the knowledge and expertise gained during the development of the website - with an emphasis on web design methods and practices, as well as their research for the annual design topic. *No On-Site Interview.*

Theme:

Embracing Electric Vehicles

Context:

Consumers are researching electric vehicles more than ever with their frequent appearances on roadways. It is estimated that by 2030, nearly one-third of all vehicles in America will be electric – potentially opening the vehicle market to 320 million people worldwide. With peak fossil fuel consumption on the horizon, and electric vehicles becoming more affordable, the automotive industry is preparing to see a consumer shift in the near future.

Challenge:

Create a fictional electric vehicle manufacturing company and design a website. The website should serve as a guide for information about the company and their electric vehicles offered. Present an overview of vehicles as if you were a consumer. Provide the type of vehicles your company creates, sells, and serves. Sections of the site may include photos, vehicle descriptions, specs, company history, contact, and news updates.

To submit your URL, please use the following link:
https://goo.gl/forms/Fm7GxO8El8vsdAgM2

Be sure to submit your URL on or before 11:59 PM on February 6, 2020.

Be sure to refer to the following site for competition updates:

http://www.tsaweb.org/Competition-Updates

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8:30 - 9:00 Registration	Atrium
9:00 - 9:30 Project Set-Up	
9:45 -10:00 Opening Session	WLC Auditorium
11:00-1:00 STEM Showcase	Atrium
11:00-1:00 Lunch	Cafeteria/ Atrium / Outside
3:00 Awards Ceremony	WLC Auditorium

Competitive Events and Location		
High School	Event Location	Room #
Animatronics	Spruce	106/108
Architectural Design	Spruce	106/108
Board Game Design	Spruce	106/108
CAD Architecture		
CAD Engineering		
Children's Stories	Spruce	106/108
Coding	WLC	161
CIM	Azalea CIM Lab	119
Digital Video Production	Spruce	138
Dragster Design	Magnolia	109
Engineering Design	Spruce	234
Flight Endurance		
Future Technology Teacher	Spruce	232
Photographic Technology	Spruce	138
Prepared Presentation	Spruce	232
Promotional Design	Spruce	138
Structural Design & Engineering	Spruce	120
Technology Bowl	Walnut	101
Transportation Modeling	Magnolia	107
Technology Problem Solving	Magnolia	109
Webmaster	Azalea	201

Competitive Events and Location		
Middle School	Event Location	Room #
Biotechnology	Spruce	106/108
Career Prep	Spruce	106/108
Children's Stories	Spruce	106/108
Coding	WLC	161
Construction Challenge	Spruce	106/108
Digital Photography	Spruce	138
Dragster	Magnolia	109
Flight		
Inventions and Innovations	Spruce	234
Junior Solar Sprint	Outside	Crop Box Pad
Mass Production	Spruce	106/108
Mechanical Engineering	Spruce	234
Medical Technology Issues	Spruce	106/108
Microcontroller Design	Spruce	106/108
Off the Grid	Spruce	106/108
Prepared Speech	Magnolia	101
Problem Solving	Magnolia	109
Promotional Marketing	Spruce	138
Structural Engineering	Spruce	120
Technology Bowl	Walnut	101
Website Design	Azalea	206

High School			
Time	Event	Location	Room
10:00	Technology Bowl Written Test	Walnut	101
10:00 -12:00	Animatronics Interview	Spruce	106/108
	Architectural Design Interviews	Spruce	106/108
	CAD Architecture		
	CAD Engineering		
	Children's Stories	Spruce	106/108
	Coding	WLC	161
	CIM	Azalea	119
	Dragster Design	Magnolia	109
	Engineering Design	Spruce	234
	Flight Endurance Testing		
	Structural Design & Engineering	Spruce	120
12:00 -2:00	Board Game Design		
	Future Technology Teacher	Spruce	232
	Prepared Presentation	Spruce	232
	Transportation Modeling	Magnolia	107
	Technology Bowl Orals	Walnut	101

Middle School			
Time	Event	Location	Room
10:00	Technology Bowl Written Test	Walnut	101
10:00 -12:00	Career Prep	Spruce	106/108
	Coding	WLC	161
	Construction Challenge	Spruce	106/108
	Dragster	Magnolia	109
	Flight Testing		
	Mass Production	Spruce	106/108
	Mechanical Engineering	Spruce	234
	Medical Technology Issues	Spruce	106/108
	Microcontroller Design	Spruce	106/108
	Prepared Speech	Magnolia	101
	Problem Solving	Magnolia	109
	Structural Engineering	Spruce	120
	Technology Bowl	Walnut	101
12:00 -2:00	Children's Stories	Spruce	106/108
	Inventions and Innovations	Spruce	234
	Junior Solar Sprint	Outside	Crop Box Pad
	Off the Grid	Spruce	106/108
	Technology Bowl Orals	Walnut	101