

CRASH TEST

OVERVIEW

Applying leadership and 21st century skills, participants will aid in stimulating elementary students' interest in TSA by encouraging middle school TSA members to share their love and interest in technology.

ELIGIBILITY

Open to middle school chapters.

10 (10) teams of two (2) members per chapter may participate.

Each team must have 1 elementary student, and 1 middle school student.

Students in 6th grade can be considered elementary students ONLY IF 6th grade is part of the elementary school in which they are currently enrolled. Students in 6th grade who are part of a K-8 or K-12 school would be considered middle school students.

ATTIRE

TSA competition attire is required.

PREPARATION

- A. Participants access the annual theme in the Colorado TSA State Competitive Events Guide.
- B. Participants (one elementary student and one middle school student) design and build a "crash test car" that will be tested in multiple head-on and rear-end collisions. The survivability of the passenger, a regular raw egg, will be a determining factor in the car's success.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this Colorado TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. The Documentation Portfolio
 - a. Documentation materials (comprising "a portfolio") are required and must be secured in a clear front report cover with the following single-sided, 8 1/2", x 11" pages, in this order:
 - i. Title page with the event title, the conference state, the year, and the team ID number; one (1) page
 - ii. Table of contents; pages as needed
 - iii. Design drawings (hand-drawn sketches or computer generated drawings); pages as needed
 - iv. Photos of the project; pages as needed
 - v. An essay describing the project and each person's part in it
 - vi. A time log documenting the time spent with the elementary student on the project
- B. The Vehicle
 - a. All entries must be designed and constructed before the conference.
 - b. Must have seating capacity for at least two (2) passengers (although only one egg will be used for testing purposes). Seating should be able to accommodate not only the egg, but the "body bag" (Ziploc™ snack size bag) as well.
 - c. Cannot use pre-made containers for the passenger compartment (for example, Rubbermaid™, Tupperware™, or similar containers). However, portions of the passenger compartment may be pre-made (for example, a single cup from an egg carton, or a plastic steering wheel from a model car kit).
 - d. The safety systems and the vehicle body should not have metal components.
 - e. Must have a windshield through which the driver can be clearly seen.
 - f. Must have at least one clearly identifiable safety system for occupant protection.
 - g. Must have both front and rear bumpers.
 - h. Must have a steering wheel within reach of the driver.
 - i. Must have a reusable way to get the driver in and out of the vehicle after each impact. The egg will be checked for survivability after every crash.

- j. Must have a flat bottom with four 1.5" strips of Velcro (the soft side) firmly attached. This will keep the vehicle on the testing sled.
 - k. Should NOT have any wheels. The wheels are provided in the form of a testing sled. (See [schematic](#) for the testing sled specifications.)
 - l. Must be between 3"-4" in width
 - m. Must be between 7"-12" in length
 - n. Has no restriction on height.
 - o. No commercially produced kits are allowed. The car must be primarily designed and built by the elementary student with guidance from the middle school student.
 - p. The vehicle will be placed on a testing sled which will serve as the wheels for the vehicle. (See [schematic](#) for the testing sled specifications.)
 - q. The ramp is made from a standard 1" x 10" X 3/4", with 1" x 2" x 3/4" boards as side rails. The block is a composite hardwood block 9" wide, 8" high and 6 1/2" thick. It is reinforced on the sides with 3/4" solid wood. The guard rails will assist the vehicle down the ramp, but will NOT prevent the vehicle from leaving the track. (See [schematic](#) for the testing ramp specifications.)
 - r. The elementary student should be the primary lead in the design and construction of the vehicle.
- C. Submission
 - a. Participants will check in their entry (vehicle/portfolio) at their scheduled interview/testing time stated in the conference schedule.
 - b. Submission information will be provided in the Colorado TSA State Competitive Events Guide.
 - D. Judges test the vehicles and score the entries at the time listed in the conference schedule.
 - A. Entries received after the time listed in the conference schedule will not be judged.
 - E. Winners are announced
 - a. Participants sign up for an interview time for the semi final challenge.
 - b. Participants are allowed up to five (5) minutes to respond to interview questions.
 - c. Participants may reference their portfolio and vehicle
 - B. Judges score the interviews.
 - C. The top three (3) finalists are announced.

EVALUATION

PRELIMINARY ROUND

- A. The documentation portfolio
- B. The vehicle

SEMIFINAL ROUND

- A. The presentation/interview

Refer to the official rating form for more information.

STEM INTEGRATION

This event aligns with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Automotive designer
- Automotive modeler
- Elementary school teacher
- Industrial designer

SEMIFINAL ROUND

- A. The Presentation/Interview

- Industrial engineer
- Race car engineer

Participant/Team ID#

CRASH TEST

2022 OFFICIAL RATING FORM

MIDDLE SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.

Go/No Go Specifications

- Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box.
- If an item is missing, leave the box next to the item blank and place a check mark in the box labeled ENTRY NOT EVALUATED.
- If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

Documentation portfolio was submitted

ENTRY NOT EVALUATED

DOCUMENTATION PORTFOLIO (60 points)				Record scores in the column spaces
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Portfolio (X1)	Portfolio is missing three or more items or is not present.	Portfolio is missing one of the following: Documentation proving the elementary student was the primary lead in the design and construction; photos, essay describing the project and each person's part in it, or a time log documenting time spent with the elementary student.	Portfolio is complete with documentation proving the elementary student was the primary lead in the design and construction of the vehicle. Photos of the project are included as well as an essay describing the project and each person's part in it. A time log documenting the time spent with the elementary student on the project is included.	
Design Specs- Construction (X1)	The car does not meet three or more design specs for length, width or height, or does not fit the test sled .	The car doesn't meet one of the design specs for length, width, or height, or may not fit the test sled.	The car meets design specs for height, width and length. It fits on the test sled properly.	
Design Specs - Construction Part 2 (X1)	The passenger area does not provide comfortable seating. There is an obstruction of the windows and the controls are not accessible by the driver.	The car has seating for at least two passengers. There may be an obstruction of the windows or controls may not be accessible by the driver.	The car has seating for at least 2 passengers. Car has unobstructed view through the windows. Steering wheel is accessible by the driver.	
Design Specs - Appearance (X1)	Car has needs for improvement in three areas: glue usage, tight fitting pieces, or clean cuts. Car is not decorated.	Car is neatly done, but there is one need for improvement: glue usage, tight fitting pieces, or clean cuts. Car is painted or decorated. Follows theme.	The car is neatly done, using a proper amount of glue, tight fitting pieces, and cuts are clean. Car is painted well. The car follows the published theme.	
Design Specs - Appearance Part II(X1)	The car is missing three or more of the following: a clear windshield, front and back bumpers or a steering wheel. There is no safety system.	The car is missing one of the following: a clear windshield, front and back bumpers or a steering wheel. There is only one safety system.	The car has a clear windshield, front and back bumpers, a steering wheel and more than that one safety system.	
Drawing (X1)	Drawing is not neat, does not reflect design of the car, or is missing. Not to scale. Measurements aren't included.	Drawing is neatly prepared and accurately reflects the design of the car, but is not to scale. Measurements are included.	Drawing is neatly prepared and accurately reflects the design of the car. The drawing is to scale. Measurements are included.	
DOCUMENTATION PORTFOLIO SUBTOTAL (60 points)				0

	participation from other team members.			
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (50 points)				0
<p>Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.</p> <p>Indicate the rule violated: _____</p>				
SEMIFINAL SUBTOTAL (50 points)				0
To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.				
TOTAL POINTS				0