

RAT TRAP DRAG RACE

OVERVIEW

Applying leadership and 21st-century skills, participants demonstrate their ability to design and construct a vehicle powered only by a standard rat trap spring, to travel a specified distance as fast as possible.

ELIGIBILITY

Open to high school chapters.

Six (6) individuals per chapter may participate.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

- A. Participants access the annual theme in the Colorado TSA State Competitive Events Guide.
- B. Participants prepare their documentation and rat trap vehicle according to the regulations.

PRELIMINARY ROUND

- A. Participants will design and build a vehicle powered by a rat trap.
- B. Participants will turn in their vehicle and documentation portfolio to the display area at the beginning of the conference.
- C. Participants will launch their own vehicles.
- D. Each vehicle will be launched once and timed.
- E. The top sixteen (16) vehicles will go to the next round.

SEMIFINAL ROUND

- A. The subsequent rounds are single-elimination, head-to-head races with the winner advancing through the bracket.
- B. Vehicles will be returned to the display area at the end of the competition.

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. The documentation portfolio must be saved as a single, multi-page PDF document with the pages presented in the following order:
 - i. Title page with the event title, the conference state, the year, and the participant ID number; one (1) page
 - ii. Table of contents; pages as needed
 - iii. Design drawings detailing each part of the mousetrap vehicle; pages as needed
 1. CAD or hand-drawn projections that include the following: two (2)-dimensional views of the top, front, and side.
 - iv. Photographs of the final build; pages as needed
 - v. References and Resources in proper Modern Language Association (MLA) style; pages as needed
- B. The Vehicle
 - a. No kits are allowed; the participant must create their own vehicle.
 - b. All entries must be designed and constructed before the conference.
 - c. Specifications
 - i. Only a standard rat trap may be used. Although the rat trap may be altered, a standard rat trap spring may be the only power source for the vehicle.
 - ii. The rat trap spring must accompany the vehicle the full length of the track.
 - iii. The vehicle may be no longer than 16" at any time during the race.
 - iv. The vehicle may be no wider than 10" at any time during the race.
- C. Vehicles that do not meet the specifications are disqualified from the race.
- D. 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.
- E. Judges test the vehicles and score the entries at the time listed in the conference schedule.

- F. Entries received after the time listed in the conference schedule will not be judged.
- G. Winners are announced

SEMIFINAL ROUND

- A. The Race
 - a. Track
 - i. The track used should be 15' long and clearly marked with a starting line and finish line.
 - ii. The track used should be a smooth, hard surface such as hardwood, vinyl, or laminate flooring.
 - b. No repair or maintenance is allowed after the entries have been checked in.
- B. Any entry damaged during the race is evaluated by the event coordinator to determine whether or not the vehicle is allowed to race again.
- C. The top three (3) finalists are announced.

EVALUATION

PRELIMINARY ROUND

- A. The documentation portfolio
- B. The vehicle

SEMIFINAL ROUND

- A. The race

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
- Industrial designer
- Industrial engineer
- Race car engineer

RAT TRAP DRAG RACE

2022 OFFICIAL RATING FORM

HIGH 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
- # Vehicle was submitted
- # ENTRY NOT EVALUATED

DOCUMENTATION PORTFOLIO (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Design Drawings (X2)	Drawing is not accurate or is missing. It does not include views of the top, front, and side. It is not to scale. Measurements are not included. Does not match photos.	Drawing accurately reflects the design of the vehicle, but is not to scale. Includes only 1-2 of the following views: top, front, and/or side. Measurements are included. Matches photo image.	Drawing accurately reflects the design of the vehicle. Includes two (2)-dimensional views of the top, front, and side. It is to scale. Measurements are included. Photo is exactly like drawing.	
Photographic Verification (X1)	Photographs of the final build are not included/photographs are extremely blurry and unclear.	Photograph of the final build is included. Rulers/other measurement tools are used in the photo to verify the specifications of the final build.	Photographs of the final build are included. Multiple point of views are evident. Rulers/other measurement tools are used in the photos to verify the specifications of the final build.	
References and Resources (X1)	A list of tools, software (if any) and resources/references used may not be included or is incomplete and/or MLA format is not used.	A list of tools, software (if any) and resources/references used is included. MLA format is used.	A detailed list of tools, software (if any) and resources/references used is included. MLA format is used.	
DOCUMENTATION PORTFOLIO SUBTOTAL (40 points)				0

VEHICLE (40 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Design Specifications (X1)	Vehicle does not meet the design specs for width and length and is out of spec for the duration of the race.	Vehicle does not meet one of the specs for width or length. It remains in spec during the race.	The vehicle meets design specs for width and length. It remains in spec during the race.	
Power (X1)	The vehicle is not powered only by a single, standard rat trap spring.	N/A	The vehicle is powered only by a single standard rat trap spring.	

Appearance (X1)	Vehicle has two or more needs for improvement: glue usage, tight fitting pieces, and cuts are clean.	Vehicle is neatly done, but there is one need for improvement: glue usage, tight fitting pieces, and cuts are clean. Vehicle is painted or decorated.	The vehicle is neatly constructed, using a proper amount of glue, tight fitting pieces, and cuts are clean.	
Integration of Theme (X1)	The current theme is not demonstrated in the vehicle.	The current theme is adequately demonstrated in the vehicle. Theme/decoration may occasionally interfere with operation of vehicle.	The current theme is exceptionally well demonstrated in the vehicle. Theme/decoration does not interfere with the operation of the vehicle.	
VEHICLE SUBTOTAL (40 points)				0

FINAL RACE PLACEMENT (50 points)				Record scores in the column spaces below.
Points awarded based on final race placement	1st Place: 50 points	4th Place: 35 points	9th-12th Place: 20 points	
	2nd Place: 45 points	5th-6th Place: 30 Points	13th-16th Place: 10 points	
	3rd Place: 40 points	7th-8th Place: 25 points	17th Place or beyond: 0 points	
FINAL RACE PLACEMENT (50 points)				0

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.

Indicate the rule violated: _____

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. TOTAL (130 points)	0
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