



C O L O R A D O
TECHNOLOGY STUDENT ASSOCIATION

COMPETITIVE EVENTS GUIDE

25th ANNUAL

**COLORADO
TECHNOLOGY STUDENT
ASSOCIATION**



**STATE LEADERSHIP
EXPOSITION
2011**



25th ANNUAL COLORADO TECHNOLOGY STUDENT ASSOCIATION STATE LEADERSHIP EXPOSITION - 2011

TABLE OF CONTENTS

Please use this document to track your TSA chapter's progress towards being prepared for the 2011 Colorado State Leadership Exposition. Please keep in mind that all of the tasks listed here must be completed by the stated deadlines, mark your calendars NOW. If you have any other questions about registration for the conference or about events please email: Tony Raymond at tony.raymond@cccs.edu.

Table of Contents

Call to Conference	3
Castle Ballistics	4
Crash Test	7
Creativity Challenge - Middle School	11
Creativity Challenge - High School	12
Fore!	13
Hydrodynamics	16
Integrated Autonomous Vehicle	18
Mousetrap Tractor Pull	22
Pin Design	24
Project Showcase	26
Rat Trap Drag Race	27
Rubberband Powered Cars	29
T-Shirt Design	31
Middle School Event Summaries	34
High School Event Summaries	38

MISSION STATEMENT

“The mission of the Technology Student Association is to prepare our membership for the challenges of a dynamic world by promoting technological literacy, leadership and problem solving, resulting in personal growth and opportunity.”

25th ANNUAL COLORADO TECHNOLOGY STUDENT ASSOCIATION STATE LEADERSHIP EXPOSITION - 2011

Sponsored by:
Colorado Community College System and Technology Student Association



COLORADO COMMUNITY
COLLEGE SYSTEM



The Colorado Technology Leadership Exposition is open to all Middle/Junior High and High School Technology Student Association chapters in the state. If you haven't started your chapter yet or to get a complete set of rules, contact:

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The mission of the Colorado Technology Student Association is to develop leadership and personal growth in a technological world. In order to help our members achieve this goal; we offer recognition in both technology and leadership arenas. We believe that by just participation in a carefully designed competition, a student becomes a "winner." He/She learns how to compete by striving to be the best.

These diverse events, which are offered to a variety of grade levels, have been designed and revised by fellow technology education teachers who have had hands-on experience. This book, the final product, is the result of the work of many individuals over the past years.

We hope you find this Competitive Events Guidebook as another motivational tool in the education of your students and plan on attending this year's Colorado Technology State Expo. Feel free to call the people listed above for more information.





CASTLE BALLISTICS

I. PURPOSE

Allow students to demonstrate their ability to design and construct a ballistic device to hit a target within a 36' x 36' area. The locations and distances will be randomly picked.

II. ELIGIBILITY FOR ENTRY

Entrants are limited to two (2) teams of three (3) per chapter. This event is open to both MIDDLE and HIGH SCHOOL students.

III. SPECIFIC REGULATIONS

- A. All entries must be turned in at the designated time. Each entrant will be responsible for obtaining time schedules at registration. The device may be either a trebuchet, ballista or a catapult.
- B. All entries must be delivered free of needed repair and/or maintenance at time of check-in.
- C. Every entrant shall submit a complete set of sketches for the ballistic device detailing each part with basic dimensions. These sketches are to be completed on 8.5" x 11" paper. A firing log or calibration table must be included. Information should be included regarding calculations of time, angle, distance, initial velocity, etc.
- D. Gravity and/or elastic material are to be the **ONLY** power sources for the ballistic device. **NO EXPLOSIVES or AIR/GAS ASSISTIVE DEVICES OR MECHANISMS WILL BE PERMITTED.** Any device that incorporates explosives or air/gas assistive devices will be disqualified.
- E. The device will launch a standard size hackey-sack/footbag. Nothing else may be launched. The average weight of the hackey-sack/footbag (between 80-90 grams). Students must provide their own hackey-sacks; they must be checked in with the device and will be weighed at the competition.
- F. The device must not tip over during launch.
- G. The device must be safe and free of hazards to those operating it and those nearby at all times. The judges determine what is safe, and are the final arbiters of safety.
- H. The maximum size of the device will be 36" high, 36" wide and 36" long. ***NO PORTION OF THE DEVICE MAY EXTEND BEYOND THE 36" BOUNDARY AT ANY TIME DURING THE LAUNCH.***
- I. If the ballistic device does not meet the size, construction or source of power specifications, it will be disqualified or receive point deductions.
- J. No kits are allowed. The participant(s) must create the device from scratch. It may be from plans not original to the team.
- K. During the launch, the hackey sacks may not hit the walls, people, ceiling or anything attached to the ceiling.
- L. The ballistic device **MUST** have a triggering device that keeps it from launching until it is time to fire. It should take very little effort to trigger the ballistic device.
- M. All participants must wear safety glasses when within 10' of their device.
- N. No one may help set up the device except the team members.

CASTLE BALLISTICS (CONTINUED)

IV. PROCEDURE

- A. Event participants must register for the event in accordance with the procedures established for the conference.
- B. Each device will be tested by itself; not against other devices.
- C. Student teams will be given 15 minutes to load, aim and launch up to three hackey sacks/footbags at three (3) randomly placed “castles” inside the testing area. The testing area will be approximately 36’ x 36’. The hackey sack/footbag must weigh between 80-90 grams (2.8-3.1 oz.). Teams will lose 5 points for every gram under 80 grams and 5 points for every gram over 90 grams. The launch area will be 36” x 36”. All portions of the device must remain within the launch area during the launch. Devices that do not stay within the launch area or do not fit within the launch area will lose 10 points. The “castles” are open-topped containers approximately 24” high, 24” wide and 24” deep. The “castles” will be placed no closer than 36” to the launch area.
- D. Each team will be given three launches per castle. Once a castle is hit or the three shots have been expended, the castle is no longer a target for that team. Left over “shots” cannot be used on remaining castles.
- E. Points will be awarded as follows: 10 points if the footbag/hackey sack is within 36” of the castle; 25 points if the footbag hits the castle; and 50 points if the footbag goes inside the castle.
- F. A tie-breaking round will be held in the event of a tie.
- G. Teams may be disqualified for interfering with adjacent teams during competition.
- H. Ballistic devices will be returned to the display area at the end of the competition.

V. EVALUATION

The following rubric will be used. In the event of a tie, a tie-breaking rounds will be held until a winner is determined.





CASTLE BALLISTICS (RUBRIC)

Castle Ballistics - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

Record information about the shots taken on each castle here. Add all shot scores together and put the result in the TOTAL column at the far right.

- Points are awarded as follows:
- If the footbag/hackey sack is within 36" of the castle: 10 pts.
 - If the footbag/hackey sack hits the castle: 25 pts.
 - If the footbag/hackey sack goes in the castle: 50 pts.

ADD ALL 9 SHOT SCORES TOGETHER AND PUT THE TOTAL AT THE FAR RIGHT

	20 Points			15 Points			10 Points			5 Points			TOTAL
	Shot 1	Shot 2	Shot 3	Shot 1	Shot 2	Shot 3	Shot 1	Shot 2	Shot 3	Shot 1	Shot 2	Shot 3	
Drawing	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the device. Measurements are included.	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the device, but is not to scale. Measurements are included.	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the device, but is not to scale. Measurements are not included.	Drawing is on 8.5" x 11" paper reflects the design of the device, but may not be accurate. It's not to scale. Measurements are not included.	Drawing is not neat, is not on 8.5" x 11" paper, is not accurate, or is missing. It is not to scale. Measurements are not included.								
Design Specs - Overall	The device meets design specs for height, width, and length.	The device does not meet one of the specs for height, width, or length.	N/A	Device does not meet two of the specs for height, width, and length.									
Design Specs - Launch Area	Device stays within the launch area and does not tip over during launch.	N/A	N/A	N/A									
Design Specs - Trigger	Has a triggering device. Very little effort required to trigger the device.	Has a triggering device. Some effort is required to trigger the device.	N/A	May not have a triggering device or takes substantial effort to trigger.									
Design Specs - Power Source	Gravity and/or elastic material are the ONLY power sources.	N/A	N/A	N/A									
Design Specs - Appearance	Device is neatly constructed, using a proper amount of glue, tight fitting pieces, and cuts are clean. Device is constructed from scratch.	Device is neatly constructed, but there is one need for improvement: glue usage, tight fitting pieces, and cuts are clean. Device is constructed from scratch.	Device is one need for improvement: glue usage, tight fitting pieces, and cuts are clean. Device may contain parts from a kit.	Device has two needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Device may contain parts from a kit.	Device has three needs for improvement: glue usage, tight fitting pieces, and cuts are clean, or device is constructed from a kit.								
Documentation	Documentation is complete with calibration table, calculations of time, angle, distance, initial velocity, etc.	Documentation is complete with calibration table, and some calculations of time, angle, distance, etc.	Documentation is complete with calibration table.	Documentation includes a calibration table.	Documentation is incomplete and does not include calibration table.								
RULES VIOLATION: MINUS 20 POINTS													
TOTAL													

CRASH TEST

STATE ONLY EVENT -- MIDDLE SCHOOL ONLY

I. GOAL

To stimulate elementary students' interest in TSA by encouraging middle school TSA members to share their love and interest in technology.

II. PURPOSE

In this event, one elementary student (grades 1-5 or 6 - **SEE ELIGIBILITY SECTION BELOW**) will work with a middle school student to 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.

III. ELIGIBILITY FOR ENTRY

This event is open to Middle School TSA Chapters.

Entrants are limited to 10 teams of two students per chapter. 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 sixth grade who are part of a K-8 or K-12 school would be considered middle school students. Contact the state advisor if there are any questions regarding eligibility.***

III. SPECIFIC REGULATIONS

- A. All entries must be designed and constructed before the conference.
- B. Vehicles must be turned into the event coordinator at the beginning of the conference to be displayed. Students may not pick up their vehicles until the end of the conference.
- C. Vehicle specifications:

The crash test vehicle:

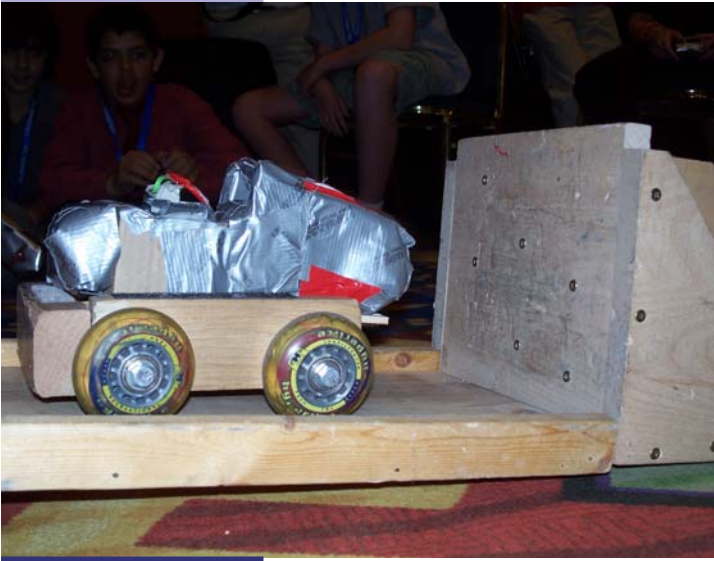
- Must resemble a passenger vehicle (for example, a car, truck or sports utility vehicle).
- Must have seating capacity for at least TWO passengers (although only one egg will be used for testing purposes). Seating should be able to accommodate not only the egg, but the "body bag" (Ziploc™ snack size bag) as well.
- Cannot use pre-made containers for the passenger compartment (for example, Rubbermaid™, Tupperware™, Gladware™ or similar containers). However, portions of the passenger compartment may pre-made (for example, a single cup from an egg carton, or a plastic steering wheel from a model car kit).
- Must have a windshield through which the driver can be clearly seen.
- Must have at least one clearly identifiable safety system for occupant protection.
- Must have both front and rear bumpers.
- Must have a steering wheel within reach of the driver.
- 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.
- 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.
- Should NOT have any wheels. The wheels are provided in the form of a testing sled. (See attached schematic for the testing sled specifications.)
- Must be between 3"-4" in width
- Must be between 7"-12" in length
- Has no restriction on height.





CRASH TEST (CONTINUED)

- D. 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.
- E. The vehicle will be placed on a testing sled which will serve as the wheels for the vehicle. A schematic of the sled is provided with these regulations.
- F. The ramp is made from a standard 1" x 10" x 3/4", with 1" x 2" x 3/4" boards as siderails. The end 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. A schematic of the ramp is included with these regulations.
- G. A drawing of the vehicle done by the elementary student must accompany the vehicle. It should be as accurate to the final model as possible.
- H. The elementary student should be the primary lead in the design and construction of the vehicle.
- I. The middle school student must present a portfolio documenting the project. Included in this portfolio should be:
- Photos of the project
 - 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.



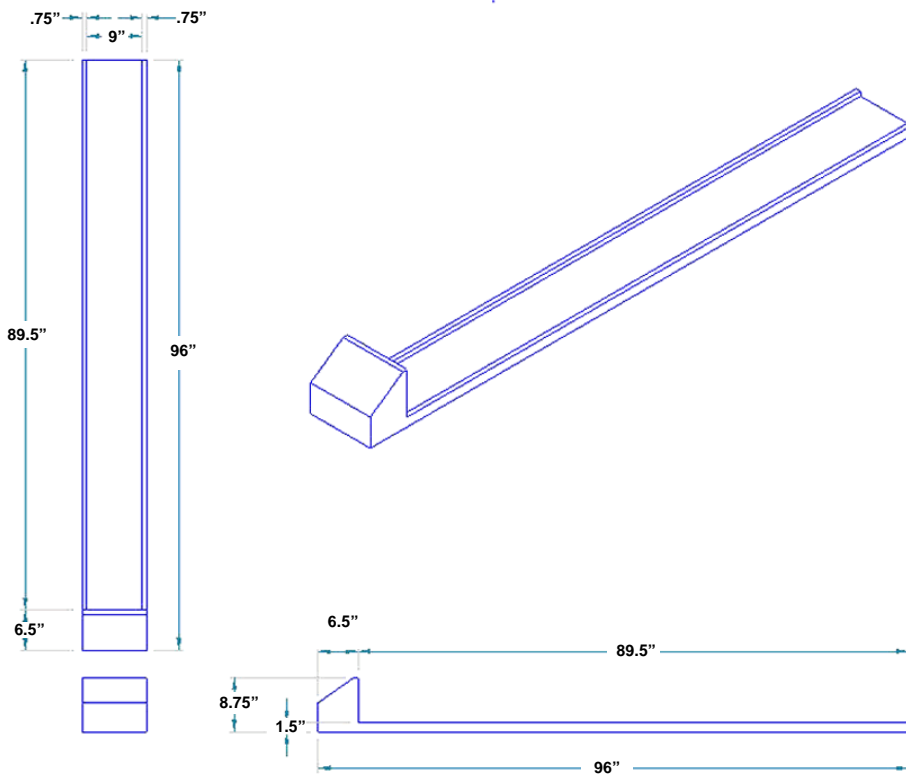
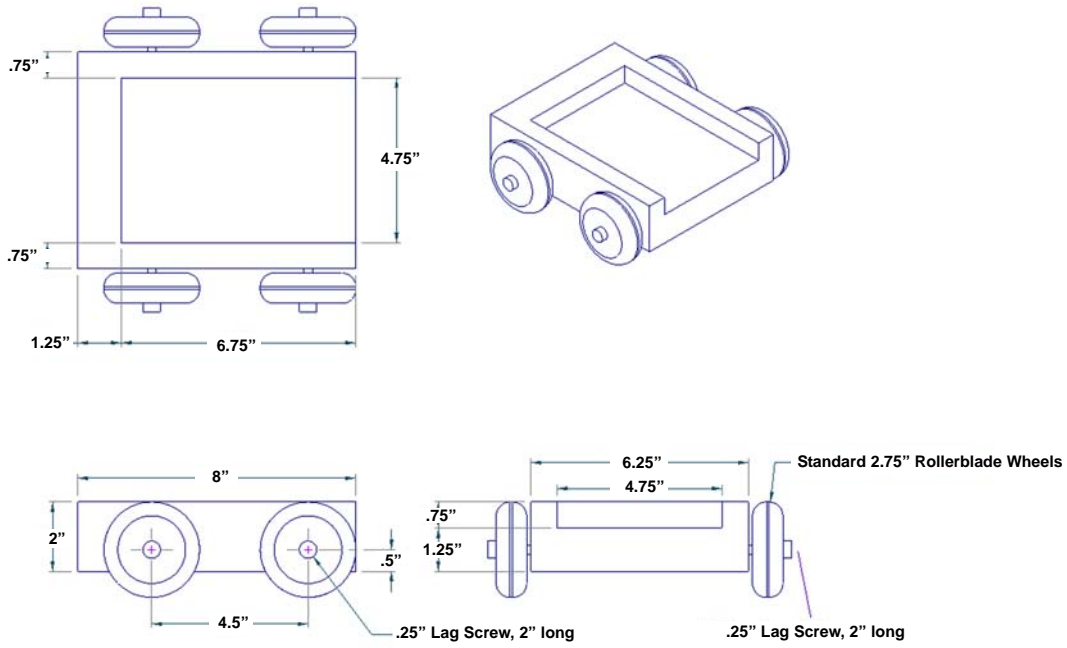
IV. PROCEDURE

- A. Participants will turn in their vehicles and design briefs to the display area at the beginning of the conference.
- B. At the time of testing, each vehicle will be given a single, raw egg and a "body bag" (a single snack-sized Ziploc™ bag) to contain any potential egg innards should the shell crack during testing.
- C. The sled, with the car attached, will be rolled down the testing ramp. At the end of the ramp will be a barrier (which may or may not have protrusions) into which the car will crash.
- D. After the car has impacted the barrier, the egg must be removed to check for cracks. If the egg is broken, the crash was unsuccessful and testing will be stopped. If the egg remains unbroken, testing will continue.
- E. The starting edge of the ramp will begin at 1' from the floor. After each successful test, the starting edge of the ramp will be raised 1', until the ramp is near vertical. If the vertical test is successful, the ramp will be lowered back to the 1' level and the car will be repositioned BACKWARDS on the sled and the tests will be repeated.
- F. Testing of the vehicle ends with either a cracked egg or completion of 16 trials (8 forward and 8 backward).
- G. Vehicles will be returned to the display area at the end of the competition.

CRASH TEST (CONTINUED)

V. SCHEMATICS

Below are the specifications for the crash test sled and ramp.





CRASH TEST (CONTINUED)

VI. EVALUATION

Each vehicle will receive points based on how many impacts the car is able to withstand, the accuracy of the drawing, and on the design portfolio. The following rubric will be used. In the event of a tie, ranking will be determined by the most innovative design. The Event Coordinator will make this determination.

Crash Test Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

		Contestant ID Number: _____				TOTAL POINTS				
		Survivability: Award points based on how high the car got BEFORE the egg cracked (e.g., if the egg cracked after a crash on Step 5, award the points for Step 4)								
		Step 2 = 4 pts	Step 3 = 6 pts	Step 4 = 8 pts	Step 5 = 10 pts	Step 6 = 12 pts	Step 7 = 14 pts	Step 8 = 16 pts		
		Step 1 = 2 pts	Step 2 = 4 pts	Step 3 = 6 pts	Step 4 = 8 pts	Step 5 = 10 pts	Step 6 = 12 pts	Step 7 = 14 pts	Step 8 = 16 pts	
		10 POINTS		8 POINTS		6 POINTS		4 POINTS		
FORWARD	Drawing is neatly prepared and accurately reflects the design of the car. The drawing is to scale. Measurements are included.	Drawing is neatly prepared and accurately reflects the design of the car, but is not to scale. Measurements are included.		Drawing accurately reflects the design of the car. It is not to scale; measurements are included.		Drawing is not neat, does not reflect design of the car, or is missing. Not to scale. Measurements aren't included.				
BACKWARD	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.	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 missing two 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 missing three or more items or is missing				
Design Specs - Construction	The car meets design specs for height, width and length. It fits on the test sled properly.	The car doesn't meet one of the design specs for length, width or height, or may not fit test sled.		The car does not meet two of the design specs for length, width or height, or may not fit test sled.		The car does not meet three or more design specs for length, width or height, or does not fit the test sled.				
	The car has comfortable seating area for at least two passengers. There is an unobstructed view through the windows. Steering wheel is 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 one passenger. May have an obstruction of the windows or the controls may not be accessible by the driver.		The passenger area does not provide comfortable seating. There is an obstruction of the windows and the controls are not accessible by the driver.				
Design Specs - Appearance	The car has a clear windshield, front and back bumpers, a steering wheel and more than one safety system.	The car is missing one of: a clear windshield, front and back bumpers or a steering wheel. There is only one safety system.		The car is missing two to three of: a clear windshield, front and back bumpers or a steering wheel. There is only one safety system.		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 neatly done, using a proper amount of glue, tight fitting pieces, and cuts are clean. Car is painted well.	Car is neatly done, but there is one need for improvement: glue usage, tight fitting pieces, or clean cuts. Car is painted or decorated.		Car has two needs for improvement: glue usags, tight fitting pieces, or clean cuts. Car is decorated but quality is lacking.		Car has needs for improvement in three areas: glue usage, tight fitting pieces, or clean cuts. Car is not decorated.				
Rules Violation:	Contest judge(s) can deduct up to 15 points for a rules violation.									GRAND TOTAL

CREATIVITY CHALLENGE - MS

STATE ONLY EVENT -- MIDDLE SCHOOL ONLY

I. GOAL

To stimulate elementary students' interest in TSA by encouraging middle school TSA members to share their love and interest in technology.

II. PURPOSE

In this ON-SITE event, one elementary student (grades 1-5 or 6 - **NOTE: SEE ELIGIBILITY SECTION BELOW**) will work with a middle school student in an on-site design problem.

III. ELIGIBILITY FOR ENTRY

This event is open to Middle School TSA Chapters.

Entrants are limited to 10 teams of two students per chapter. Each team **MUST** have 1 elementary student, and one 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 sixth grade who are part of a K-8 or K-12 school would be considered middle school students. Contact the state advisor if there are any questions regarding eligibility.***

III. PROCEDURE/SPECIFIC REGULATIONS

- A. Participants report to the event area at the time and place stated in the conference program.
- B. The teams allowed 1 hour and 30 minutes to design and construct a solution.
- C. Each solution is tested as soon as possible after the construction phase is completed.
- D. All work must be completed in the event area during the time specified for the event.
- E. All materials are provided. Only the materials issued to each team by the event coordinator may be used in the development of the solution.

IV. EVALUATION

Each team's solution is evaluated objectively. A finite measure, such as elapsed time, horizontal or vertical distance, and/or strength, is used to determine the best solution. Solution designs will be used to break ties. Only as a last resort does the event coordinator use subjective measurement, such as originality, to evaluate solutions.





CREATIVITY CHALLENGE - HS

STATE ONLY EVENT -- HIGH SCHOOL ONLY

I. GOAL

To stimulate elementary students' interest in TSA by encouraging high school TSA members to share their love and interest in technology.

II. PURPOSE

In this ON-SITE event, one elementary student (grades 1-5 or 6 - *NOTE: SEE ELIGIBILITY SECTION BELOW*) will work with a high school student in an on-site design problem.

III. ELIGIBILITY FOR ENTRY

This event is open to High School TSA Chapters.

Entrants are limited to 10 teams of two students per chapter. Each team **MUST** have 1 elementary student (grades 1-5 or 6).

*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 sixth grade who are part of a K-8 or K-12 school would be considered middle school students. Contact the state advisor if there are any questions regarding eligibility.*

III. PROCEDURE/SPECIFIC REGULATIONS

- A. Participants report to the event area at the time and place stated in the conference program.
- B. The teams allowed 1 hour and 30 minutes to design and construct a solution.
- C. Each solution is tested as soon as possible after the construction phase is completed.
- D. All work must be completed in the event area during the time specified for the event.
- E. All materials are provided. Only the materials issued to each team by the event coordinator may be used in the development of the solution.

IV. EVALUATION

Each team's solution is evaluated objectively. A finite measure, such as elapsed time, horizontal or vertical distance, and/or strength, is used to determine the best solution. Solution designs will be used to break ties. Only as a last resort does the event coordinator use subjective measurement, such as originality, to evaluate solutions.



FORE!

STATE ONLY EVENT -- HIGH SCHOOL ONLY



I. GOAL

To stimulate elementary students' interest in TSA by encouraging high school TSA members to share their love and interest in technology.

II. PURPOSE

The local parks and recreation department has recently begun work on renovating the municipal golf course. Prior to the renovation, there was an 9-hole themed miniature golf course which had become dated and unattractive. As part of the renovation, the Department of Parks and Recreation has the opportunity to update the course; they want to design and build an attractive course that is appealing to all of the city's residents and have put out a call for design ideas for a new 9-hole golf course.

Your design team, consisting of one elementary student (grades 1-5 or 6 - **NOTE: SEE ELIGIBILITY SECTION BELOW**) and one high school student, has been hired to design and develop one hole for the proposed miniature golf course.

III. ELIGIBILITY FOR ENTRY

This event is open to High School TSA Chapters.

Entrants are limited to 10 teams of two students per chapter. Each team **MUST** have 1 elementary student (grades 1-5 or 6), and one high 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 sixth grade who are part of a K-8 or K-12 school would be considered middle school students. Contact the state advisor if there are any questions regarding eligibility.*

III. SPECIFIC REGULATIONS

- A. Your group will present:
 - Drawings of your design creation
 - A list of necessary materials
 - A constructed, playable table top model of your creation
 - All entries must be designed and constructed before the conference.
- B. Golf course holes must be turned into the event coordinator at the beginning of the conference to be displayed. Students may not pick up their models until the end of the conference.
- C. Specifications:

The high school student must present a portfolio documenting the project. Included in this portfolio should be:

- A list of materials (including cost)
- Photos of the project
- An short essay describing the golf course hole and each person's part in the project. Included in this essay should be an explanation of how the par of the hole was determined.
- A time log documenting the time spent with the elementary student on the project.
- A colored blueprint/schematic of the hole with all parts clearly labeled.



FORE! (CONTINUED)

The model should meet the following specifications:

- The golf course hole model must be a playable tabletop model not to exceed 24" x 24".
- The model must include a "tee" area.
- The model must include a cup 1" in diameter.
- The model must include a marble to serve as a miniature golf ball.
- The team must design and develop a "putter" or launch mechanism to hit the ball on the hole.
- In order to minimize costs, the model should be constructed primarily from recyclable materials.

D. The elementary student should be the primary lead in the design and construction of the model.

IV. PROCEDURE

- A. Participants will turn in their golf course holes and design portfolios to the display area at the designated time.
- B. Each golf course hole will be demonstrated by the design team. The team's "putter" or launch mechanism will be used to propel the golf ball through the course.
- C. Golf courses will be returned to the display area at the end of the competition.

V. EVALUATION

Each golf course hole will be evaluated using the rubric on the next page. The project will receive points based on the design folder prepared by the high school student. The following rubric will be used. In the event of a tie, ranking will be determined by the most economically-produced model. The Event Coordinator will make this determination.

FORE!

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

20 Points	15 Points	10 Points	5 Points
<p>Portfolio is complete and easy to read and is clearly understandable. It includes:</p> <ul style="list-style-type: none"> A detailed list of materials used in the creation of the hole. Multiple photographs detailing the work of the TSA member AND the elementary student in the creation of the model. A short essay describing in detail the golf course hole and each person's part in the project. A detailed time log documenting the time spent with the elementary student. A colored blueprint/schematic of the hole will all part/features clearly labeled. 	<p>Portfolio is complete and includes:</p> <ul style="list-style-type: none"> A list of materials used in the creation of the hole. Photographs detailing the work of the TSA member AND the elementary student in the creation of the model. An essay describing in detail the golf course hole and each person's part in the project. A time log documenting the time spent with the elementary student. A blueprint/schematic of the hole will all part/features clearly labeled. 	<p>The portfolio may be missing one of the following items or the information presented is not complete:</p> <ul style="list-style-type: none"> A list of materials used in the creation of the hole. Photographs detailing the work of the TSA member AND the elementary student in the creation of the model. An essay describing in detail the golf course hole and each person's part in the project. A time log documenting the time spent with the elementary student. A blueprint/schematic of the hole will all part/features clearly labeled. 	<p>The portfolio may be missing two or more of the following items and/or the information presented is not complete:</p> <ul style="list-style-type: none"> A list of materials used in the creation of the hole. Photographs detailing the work of the TSA member AND the elementary student in the creation of the model. An essay describing in detail the hole and each person's part in the project. A time log documenting the time spent with the elementary student. A blueprint/schematic of the hole will all part/features clearly labeled.
<p>The model hole:</p> <ul style="list-style-type: none"> Fits within the 24" x 24" dimensions Includes a "tee" area Includes a cup 1" in diameter Includes a marble to serve as a ball. Has a student-developed putter/launch mechanism to hit the ball on the hole. Is constructed from recycled materials. 	<p>The model includes/meets all but ONE of the following:</p> <ul style="list-style-type: none"> Fits within the 24" x 24" dimensions Includes a "tee" area Includes a cup 1" in diameter Has a student-developed putter/launch mechanism to hit the ball on the hole. Is constructed from recycled materials. 	<p>The model is missing two or three items from the following:</p> <ul style="list-style-type: none"> Fits within the 24" x 24" dimensions Includes a "tee" area Includes a cup 1" in diameter Has a student-developed putter/launch mechanism to hit the ball on the hole. Is constructed from recycled materials. 	<p>The model is missing three or more items from the following:</p> <ul style="list-style-type: none"> Fits within the 24" x 24" dimensions Includes a "tee" area Includes a cup 1" in diameter Has a student-developed putter/launch mechanism to hit the ball on the hole. Is constructed from recycled materials.
<p>The hole takes full advantage of all available space. Many include multiple levels or other features such as tunnels or uneven topography.</p>	<p>The hole adequately uses the space provided; may include one feature such as a tunnel or uneven topography.</p>	<p>The hole may not make good use of the available space and does not utilize unique features such as tunnels or uneven topography.</p>	<p>The hole makes poor use of the space; design indicates simple two-dimensional design. No special features such as tunnels or uneven topography are included.</p>
<p>The model accurately follows the drawings. The model is complete with greens, walkways, bumpers, tees, holes, flags and obstacles. The goal is readily apparent. The hole is well constructed and neatly presented.</p>	<p>The model is complete but there may be some difference between plans and actual model. Model includes greens, walkways, bumpers, tees, holes, flags and obstacles. Goal is apparent. The hole is well constructed.</p>	<p>The model is present, but may not be complete; some parts may be missing. Goal is not readily apparent. The hole may be lacking in quality of construction.</p>	<p>The model is incomplete. Many parts of the model are missing. The hole is not well constructed.</p>
<p>Rules Violation: Contest judge(s) can deduct up to 15 points for a rules violation.</p>			
<p>TOTAL</p>			





HYDRODYNAMICS

STATE ONLY EVENT -- HIGH SCHOOL ONLY

I. PURPOSE

Allow students to demonstrate their ability to design and construct a boat to travel through water, powered only by one standard rubber band.

II. ELIGIBILITY FOR ENTRY

This event is open to High School TSA chapters. Entrants are limited to **SIX (6)** per school.

III. SPECIFIC REGULATIONS

- A. All entries must be turned in at the designated time. Each entrant will be responsible for obtaining time schedules at registration.
- B. All entries must be delivered free of needed repair and/or maintenance at time of check-in.
- C. Every entrant shall submit a complete set of sketches for the boat detailing each part with basic dimensions. These sketches are to be completed on 8 1/2" x 11" paper.
- D. Although the rubber band may be altered, a 3" x 1/8" rubber band may be the **only** power source for the vehicle.
- E. The rubber band must accompany the boat the full length of the course. The course will be 20' long, 17" wide & 3" deep. It will be a plywood frame, lined with plastic.
- F. The rubber band may not be attached to anything outside of the boat.
- G. The boat must stay in the water the full length of the course.
- H. The maximum size of the boat will be 15" wide x 16" long x 16" above the water. The boat and all parts of the boat must stay within the dimension limitations for the entire length of the course.
- I. If the boat does not meet the specifications, points will be deducted from the final score.
- J. No kits are allowed; the participant must create the vehicle.

IV. PROCEDURE

- A. Registration: Event participants must register for the event in accordance with the procedures established for the conference.
- B. Each participant will be allowed to race his or her boat three times.
- C. A race off will be held in the case of a tie.
- D. Boats will be returned to the display area at the end of the competition.

V. EVALUATION

The craft will be evaluated based on the rubric on the following page. In the event of a tie after testing, ranking will be determined by the most economically-produced model. The Event Coordinator will make this determination.

Hydrodynamics - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

Trials: Record information about the three trials runs here. Use the data to calculate the Distance Trials Points and the Time Trials Points.

Distance Traveled (in inches)	Elapsed Time (in seconds)
Trial 1	
Trial 2	
Trial 3	

Distance Trials: Calculated by: Distances (in inches) traveled / Total Track Length x 10 points)

Distance Trial 1: _____ / 240 = _____

Distance Trial 2: _____ / 240 = _____

Distance Trial 3: _____ / 240 = _____

TOTAL = (_____ / 3) x 10 = _____ = **PUT TOTAL HERE >>**

Time Trials: Calculated by: Distances (in inches) traveled / Time (in seconds)

Time Trial 1: _____" / _____ sec. = _____" / second

Time Trial 2: _____" / _____ sec. = _____" / second

Time Trial 3: _____" / _____ sec. = _____" / second

TOTAL = (_____ / 3) = _____ = **PUT TOTAL HERE >>**

	20 Points	15 Points	10 Points	5 Points	TOTAL
Drawing	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the boat. It is to scale. Measurements are included.	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the boat, but is not to scale. Measurements are included.	Drawing is on 8.5" x 11" paper reflects the design of the boat, but may not be accurate. It's not to scale. Measurements are not included.	Drawing is not neat, is not on 8.5" x 11" paper, is not accurate, or is missing. It is not to scale. Measurements are not included.	
Design Specs-Overall	The boat meets design specs for height, width, and length. It fits in the track properly.	Boat does not meet one of the specs for height, width, and length or may not fit in the track properly.	Boat does not meet two of the specs for height, width, and length or may not fit in the track properly.	The boat does not meet three of the design specs for height, width, and length or does not fit in the track.	
Rubberband	The rubber band is a single 3" x 1/8" rubberband. It is not attached to anything outside the boat. It accompanied the boat during the trials.	N/A	N/A	The rubber band does not meet any of the specifications.	
Performance	Boat doesn't leave the track.	N/A	N/A	Boat leaves the track during the trials.	
Appearance	Boat is neatly constructed, using a proper amount of glue, tight fitting pieces, and cuts are clean. Boat is decorated/themed.	Boat is neatly done, but there is one need for improvement: glue usage, tight fitting pieces, and cuts are clean. Boat is painted or decorated. Theme is not clear.	Boat has two needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Boat is decorated, but quality is lacking. Theme is not clear.	Boat has three needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Boat is not decorated or themed.	
Rules Violation:	Contest judge(s) can deduct up to 20 points for a rules violation.				
TOTAL					





INTEGRATED AUTONOMOUS VEHICLE

I. PURPOSE

The purpose of the challenge is to create and operate an integrated autonomous vehicle. The vehicle will operate in a number of courses, but must be able to navigate a course without prior knowledge of distance or direction within a chosen course. Two separate modes of operation will be used: Student-controlled and Autonomous.

II. ELIGIBILITY FOR ENTRY

Eligibility is limited to two (2) teams of three (3) members per chapter. This event is open to HIGH SCHOOL STUDENTS.

III. SPECIFIC REGULATIONS

- A. All entries must be turned in at the designated time. Each team is responsible for signing up for a technical interview time. The whole team will attend the technical interview.
- B. Every entry shall include a standard three ring 8.5" x 11" notebook. The notebook shall contain:
 - A title page with the event title, state conference information, including date of conference.
 - A one (1) page, typewritten description of the vehicle, including the building system/ components used, a brief discussion of the program language and any special features of the vehicle/programming and student driver interface.
 - A set of mechanical technical drawings of the vehicle. The drawings will present a plan view, at least two elevations, and cut sheets for specific features.
 - At least one (1) page of schematic drawings representing the vehicle's control systems.
 - A programming log, including a printout of the complete program for operation. Comments in the program log are encouraged.
- C. Vehicles may be constructed from a kit or may be built from scratch. Kits include: Lego RCX, Lego NXT, VEX, GEARS Educational System, Parallax Boe-Bot, Arduino Microcontroller, or any other available microcontroller system. Entries built from scratch may contain any portion of the above listed kits (i.e., Lego gears driven by an Arduino microcontroller servo.)
- D. A student-controlled run will be made using a remote control system. This system includes all available RF spectra, Bluetooth and infrared communication. RCX-based vehicles may use a tethered remote based on touch sensors or use an Infrared or adapted radio frequency control system. Vehicles will be inspected for remote control links. Programming of vehicles via Bluetooth, RF or infrared is allowed but may not be used during the autonomous runs.
- E. Each team will be expected to discuss program flow, performance and engineering aspects of their vehicle. Discussions may or may not be limited to the technical interview. Due to the highly technical nature of the challenge, expect the judges to ask the team questions.
- F. Any vehicle deemed unsafe by the judges will be removed from competition, only to return at the judge's discretion.

INTEGRATED AUTONOMOUS VEHICLE (CONTINUED)

- G. Ultrasonic, infrared, touch, motion, and light sensors may be used. Distance encoders may be used as well. The use of distance-based programming is discouraged. A radio frequency link may consist of traditional RF equipment, including off-the-shelf transmitters and receivers as well as component-built or “adapted” systems. Infrared communication is allowed - however, please alert the judging team at the check-in if you are using infrared (this will prevent you reprogramming or interfering with another team that may also be using infrared.) If your team plans on using infrared, line a shoebox with aluminum foil and store your vehicle in it to avoid interference from another team’s control/program stream.
- H. Time will be afforded to each team in order to make modifications to their vehicle and programs.
- I. A team may provide navigation beacons as a means to mark the course. Beacons may be infrared, visible spectrum or sonic. Sonic beacons in the audible range are subject to the judge’s approval, and a beacon deemed disruptive will be removed from the challenge, (e.g., a continuous tone at 9 KHZ)
- J. Once the beacon is placed it may not be moved until after the team placing it has completed its run.
- K. The use of fiduciary markers is allowed. Fiducials may be 4"x4" or less and the team may only have as many fiducials as there are intersections in the course.
- L. The use of cell phones during the competition is strictly prohibited. The only cell phone permitted in use is the one controlling a robot during the student-operated portion. This includes spectators. If the judges see a cell phone in the contest area, they will ask that it be put away; if the judge sees the cell phone a second time, the person will be asked to leave the contest area. This is consistent with other TSA challenges.
- M. The vehicle may not exceed the following dimensions: 7-1/2” high, 7-1/2” wide, and 7-1/2” long.

IV. PROCEDURE

- A. Each vehicle will make three timed runs on a course that is 8’ x 8’ (the equivalent of 2 - 4’ x 8’ sheets of plywood laid side by side). The course will have barrier walls 3-1/2” high and will be placed in a random configuration. Every effort will be made to give a unique course for each vehicle run. The floor of the course will be a plywood sheet, laid out with a grid of holes drilled on 4” centers. Barrier walls 3-1/2” high with lengths of 8”, 12” and 16” will be moved around the grid to provide randomly changing courses. The outside edge of the plywood will have a permanently affixed 3-1/2” barrier. Classroom or home courses may be constructed of plywood and 1x4” pine to match the challenge course.





INTEGRATED AUTONOMOUS VEHICLE (*CONTINUED*)

- B. The runs will increase in difficulty. The first run is student-operated via the remote control system. Students have the option to add moving a block placed at random in the course to the end of the course. The block dimensions are 1-1/2" x 1-1/2" x 3" tall, and the block is painted red. Should the students opt to move the block, it must be moved to the end of the course and placed in a marked 4" square area at the end of the course. If a team chooses not to move the block, 20 points will be added to the overall score. The second round of testing is autonomous. In the second round, there will be an area within the course where the vehicle will have to make a choice between two possible paths. Each path leads to the finish, but the vehicle must be able to decide upon one of two choices. In the third course, the vehicle will have to navigate over a rough section of the course. This rough section may comprise 25% of the course. Vehicles should possess a ground clearance of 1/2".
- C. Each second a vehicle touches a wall will add one second to the vehicle's overall time. A vehicle navigating using touch sensors is allowed, but the touch time will be added to the overall time. Each contact with the wall will be counted as one second, even if the actual touch is less. Contact time will be rounded up (i.e., a 4.2-second touch will be counted as a 5-second penalty).
- D. At any point during the autonomous runs, the team may choose to add moving the block to the end of the course. Should the students opt to move the block, it must be moved to the end of the course and placed in a marked 4" square area at the end of the course to qualify for a 30-point deduction.
- E. At the end of the three runs, the scores from the technical interview, the notebook and the runs will be totaled and the lowest score wins.

V. EVALUATION

The following rubric will be used. In the event of a tie, a tie-breaking rounds may be held until a winner is determined.

INTEGRATED AUTONOMOUS VEHICLE (RUBRIC)

Integrated Autonomous Vehicle - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

AREA	40 Points	30 Points	20 Points	10 Points	Total Points/Comments
Technical Drawing/ Dimensioning	Drawing did not represent accurately the vehicle, no cut sheets or detail callout. Dimensions not shown or not accurate. No electrical schematic.	Drawing is vague, dimensions are present, but not complete, or are vague or callouts/ cut sheets are vague or lacking detail.	Drawing is well detailed, dimensions are accurate and thorough, callouts /cut sheets are well detailed and accurate.	A professional level of detail, all drawings are accurate. Elevation , plan and cut/callout are ready to ship to a fabricator.	
Technical Interview	Team is unable to explain function, operation, programming, or construction of the vehicle.	Team is vague or unable to explain specific parts, and the principles behind their operation for their vehicle.	Team is able to converse freely about engineering, programming, physics and mechanics of their vehicle.	Team is able to demonstrate advanced understanding of all areas of the vehicle and the challenge, including alternate design strategies.	
Programming Documentation	Little or no programming.	Programming documentation is presented, but lacks detail or is unable to be discussed by the programmer.	Programming is presented clearly with discussion of sensor arrays, loops, branches, or subroutines.	Programming shows a high level of expertise, creativity. May use unexpected data structures or a high level language, or both.	
Course Time	The course times (3) are added together and combined with the preceding scores. The lowest overall score wins. 1 st time/student operator = Remote op Added block=+0,no block=+20 2 nd time/ autonomous = 3 rd time/autonomous = Autonomous added block= -30, no block =+0				If the judges are in unanimous agreement that a team has exceeded the requirements of judging, either through performance or design excellence, a point deduction may be awarded the team. Point deduction= Comment/





MOUSETRAP TRACTOR PULL

STATE ONLY EVENT -- MIDDLE SCHOOL ONLY

I. PURPOSE

To allow students to demonstrate their ability to design and construct a vehicle powered only by a standard mousetrap spring, to pull as much weight as possible.

II. ELIGIBILITY FOR ENTRY

This event is open to Middle School TSA chapters. Entrants are limited to **SIX (6)** per school.

III. SPECIFIC REGULATIONS

- A. All entries must be designed and constructed before the conference.
- B. Vehicles must be turned into the event coordinator at the beginning of the conference to be displayed. Students may not pick up their vehicles until the end of the conference.
- C. Every entrant shall submit a complete set of sketches for the mousetrap vehicle detailing each part with basic dimensions. These sketches are to be completed on 8-1/2" x 11" paper.
- D. Although the mousetrap may be altered, a standard mousetrap spring may be the **only** power source for the vehicle.
- D. The mousetrap spring must accompany the vehicle the full length of the track.
- E. Vehicle Specifications:
 - The vehicle may be no longer than 16" at any time during the pull.
 - The vehicle may be no wider than 10" at any time during the pull.
 - The vehicle must have a fixed hook or eye in which a cup hook may be attached. It should be centered in the very back and 1/2" above the ground.
- F. The track will be 3 feet long. The vehicle must pull dead weight 2 feet.
- G. The 'sled' will be a wooden device in which weight can be loaded.
- H. The surface that both the vehicle and the sled will travel on will be wood.
- I. If the car does not meet the specifications, it will have points deducted from the score.
- J. The weight sled may not be lifted at any time during the pull.
- K. Only a standard mousetrap may be used. **No rat traps.**
- L. No kits are allowed; the participant must create the vehicle.

IV. PROCEDURE

- A. Participants will turn in their vehicle to the display area at the beginning of the conference.
- B. Each vehicle will be given the opportunity to pull an appropriate starting weight. Those that successfully pull that given weight will then enter Round 2. The process will be repeated with weight being added to the sled in each round until only one vehicle remains.
- C. Participants must launch their own vehicles.
- D. Vehicles will be returned to the display area at the end of the competition.

MOUSETRAP TRACTOR PULL (CONTINUED)

V. EVALUATION

The following rubric will be used to evaluate the vehicle. The vehicle that pulls the most weight will determine final ranking. In the case of a tie, ranking will be determined by the most innovative design. The Event Coordinator will make this decision.

Mousetrap Tractor Pull - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

Pulling Trials: Record information about the trials.

Trial 1 - Weight _____	Trial 5 - Weight _____	Trial 9 - Weight _____	Trial 13 - Weight _____	Trial 17 - Weight _____	Trial 21 - Weight _____
Trial 2 - Weight _____	Trial 6 - Weight _____	Trial 10 - Weight _____	Trial 14 - Weight _____	Trial 18 - Weight _____	Trial 22 - Weight _____
Trial 3 - Weight _____	Trial 7 - Weight _____	Trial 11 - Weight _____	Trial 15 - Weight _____	Trial 19 - Weight _____	Trial 23 - Weight _____
Trial 4 - Weight _____	Trial 8 - Weight _____	Trial 12 - Weight _____	Trial 16 - Weight _____	Trial 20 - Weight _____	Trial 24 - Weight _____

Calculate points for pulling trials:

Multiply the # of the highest successful trial by 2 (e.g., Trial 16 = 16 x 2 = Total Trial Points

PUT TOTAL HERE >>

	10 Points	8 Points	6 Points	4 Points	
Drawing	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the vehicle. It is to scale. Measurements are included.	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the vehicle, but is not to scale. Measurements are included.	Drawing is on 8.5" x 11" paper reflects the design of the vehicle, but may not be accurate. It's not to scale. Measurements aren't included.	Drawing is not neat, is not on 8.5" x 11" paper, is not accurate, or is missing. It is not to scale. Measurements are not included.	
Design Specs - Overall	The vehicle meets design specs for height, width, and length. It has a fixed hook properly positioned at the back of the vehicle.	The vehicle does not meet one of the design specs for length, width or height, or the fixed hook is not properly positioned.	The vehicle does not meet two of the design specs for length, width or height or may not have a hook for pulling that is easily accessible.	The vehicle does not meet three or more design specs for length, width, or height or does not have a hook for pulling the sled.	
Design Specs - Mousetrap	The vehicle is powered only by a single, standard mousetrap.	N/A	N/A	The vehicle is not powered only by a single, standard mousetrap.	
Design Specs - Appearance	The vehicle is neatly constructed, using a proper amount of glue, tight fitting pieces, and cuts are clean. Vehicle is decorated/themed. Theme/decoration does not interfere with operation of vehicle.	The 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. Theme is not clear. Theme/decoration may occasionally interfere with operation of the vehicle.	The vehicle has two needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Vehicle is decorated, but quality is lacking. Theme is not clear. Theme/decoration consistently interferes with the operation of the vehicle.	The vehicle has three needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Vehicle is not decorated or themed.	
Rules Violation:	Contest judge(s) can deduct up to 15 points for a rules violation.				
TOTAL OF TRIAL POINTS PLUS SPECS POINTS					





PIN DESIGN

STATE ONLY EVENT

OVERVIEW:

Participants are required to develop and present a pin design for Colorado TSA to be traded at the National TSA Conference. Winners in both the middle school AND high school categories will be selected. *For 2011, the pin design theme is Colorado TSA's 25th Anniversary.*

I. PURPOSE

Provide a means for TSA members to demonstrate their ability to communicate design and layout skills.

II. ELIGIBILITY FOR ENTRY

Entries are limited to **SIX** (6) per chapter. Open to both MIDDLE and HIGH school students.

III. SPECIFIC REGULATIONS

- A. The pin design is an individual event. No recognition will be given for a group effort.
- B. The design may not exceed 1-1/4" by 1-1/4". (However, Larger print outs can be included to view detail-this is in addition to actual size printout not in replacement.)
- C. An original line type illustration(s) must be used that reflects or interprets or in some other way communicates Colorado TSA's 25th Anniversary. The pin must include the TSA logo.
- D. Pin must be designed for a cloisonné type of pin.
- E. The design is limited to no more than four (4) colors.
- F. The pin must have color separations – with the requested style of pin it will have raised lines of either gold or silver between the colors (this does not count as one of your four colors) – ***there cannot be gradients in any of the colors.***
- G. Prepare a print out of the design entry. The print out should include an “actual size” as well as a larger view of the design. Public domain computer clip art may be included in the design.
- H. Use of copyrighted or registered artwork in design is prohibited without verified permission from the original artist/publisher.
- J. Inclusion of the design either on a CD/DVD is **required** in a JPEG or editable PNG format.

IV. PROCEDURE

- A. Registration: Event participants must register and follow the guidelines for the event in accordance with the procedures established for the conference.
- B. ALL designs must include a digital copy of the design as well as a hard copy print out as stated above to be considered for the competition.
- C. All winning entries will become the property of COTSA.

PIN DESIGN (CONTINUED)

V. EVALUATION

- A. Middle School level and High School level winning designs will both be reproduced for trading at the national conference.
- B. Copies of previous winning pin designs shall not be used.
- C. TSA reserves the right to modify design as needed for production of the pin.
- D. Winning pin designs may or may not be selected to be the pins that represent Colorado as the trading pins at national competition.

Pin Design - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

	10 Points	8 Points	6 Points	4 Points	TOTAL
Design Specs - Artwork	Pin design is prepared neatly and in color. Artwork may be computer generated. Artwork is clear and all elements are distinct and easily readable/recognizable. An "actual size" graphic is present AND a larger representation of the design to view detail is present.	Pin design is neatly prepared and is in color. Artwork is clear and all elements are distinct and easily readable/recognizable. An "actual size" graphic is present.	Pin design may not be neatly prepared or is not in color. Some elements may not be clear and/or distinct. An "actual size" graphic may not be present.	Pin design is poorly prepared or is not in color. Artwork elements are not clear or distinct. Artwork does not include an "actual size" of design; only a larger representation graphic of the design is present.	
	The artwork is a line-type illustration that reflects, interprets, or in some other way communicates a Colorado theme, incorporates the TSA logo and year of the national conference.	The artwork is missing one of the following elements: a Colorado theme, the TSA logo or year of the national conference.	The artwork is missing two or more of the following elements: a Colorado theme, the TSA logo or year of the national conference. The letters "TSA" are not from the official logo.	The artwork does not contain any of the required design elements.	
	The artwork contains four or fewer SEPARATE colors; each color is separated by a line. The pin is NOT a photograph nor does it contain gradient colors or gradient images.	The artwork contains more than four colors which are not separated by a distinct line or is a photograph, or has gradient colors or images.	The artwork contains more than four colors which are not separated by a distinct line AND is a photograph, or has gradient colors or images.	The artwork does not meet any of the requirements for color or image style.	
Design Specs - Documentation	The design is accompanied by documentation of where the artwork was obtained, with permission from the original artist/publisher if applicable.	N/A	N/A	The design is not accompanied by any documentation of where the artwork was obtained.	
Design Specs - Size	The pin design does not exceed 1-1/4" x 1-1/4".	N/A	N/A	The pin design exceeds 1-1/4" x 1-1/4" in height, width or both.	
Design Specs - CD/DVD	The entry has a CD/DVD containing the design in JPEG and/or editable PNG format.	N/A	N/A	The entry does not have a CD/DVD containing the design.	
Rules Violation:	Contest judge(s) can deduct up to 12 points for a rules violation.				
	TOTAL				





PROJECT SHOWCASE*

STATE ONLY EVENT

OVERVIEW:

The goal of the Technology Student Association is to allow as much participation as possible by students in the Colorado Technology Expo. For this reason, a division called “Project Showcase” was established.

I. PURPOSE

To display student projects that are “Show-worthy” but do not match the criteria of the other events. This is a non-competitive event and does not earn points for your school toward the Chapter of the Year award.

II. ELIGIBILITY FOR ENTRY

This event is open to Middle School and High School TSA Chapters. Entries will be limited to **FIVE (5)** per chapter.

III. SPECIFIC REGULATIONS

A. Major areas

- Construction
- Energy, Power & Transportation
- Communications
- Manufacturing
- Woods
- Metals
- Drafting
- Graphics
- Electronics
- Combination (materials) projects
- Kit projects may also be included

B. Submission criteria

- Submit a diagram or a working drawing equivalent with a typewritten explanation (not more than five pages) that describes the scope of the project. This description could include: time spent on the project, research, fabrication, tools, equipment & processes used, etc. (Working drawings should not be included as part of the written description.)
- A bill of materials (spec. sheet).
- Validation that project was developed through a Technology Education Program.

IV. PROCEDURE

- A. Registration: Event participants must register for the event in accordance with the procedures established for the conference.
- B. Participants must have the product in the display area specified in the conference program.
- C. Products must be picked up by the assigned pick-up time.

V. EVALUATION

The project will be evaluated based on quality of workmanship, the degree of difficulty (grade level taken into account), as well as the student portfolio.

*** NOTE: This event DOES NOT count toward point totals for State Chapter of the Year.**

RAT TRAP DRAG RACE

STATE ONLY EVENT -- HIGH SCHOOL ONLY

I. PURPOSE

To allow students to 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.

II. ELIGIBILITY FOR ENTRY

This event is open to High School TSA Chapters. Entrants are limited to **SIX (6)** per school.

III. SPECIFIC REGULATIONS

- A. All entries must be designed and constructed before the conference.
- B. Vehicles must be turned into the event coordinator at the beginning of the conference to be displayed. Students may not pick up their vehicles until the end of the conference.
- C. Although the rat trap can be altered, a standard rat trap spring may be the only power source for the vehicle.
- D. The rat trap spring must accompany the vehicle the full length of the track.
- E. Vehicle Specifications:
 - The vehicle may be no longer than 16" at any time during the race.
 - The vehicle may be no wider than 10" at any time during the race.
- F. The track will be 15' long.
- G. The surface the vehicles will travel on will be hotel-grade carpet.
- H. If the vehicle does not meet the specifications, it will have points deducted from the final score.
- I. Only a standard rat trap may be used.
- J. No kits are allowed; the participant must create the vehicle.

IV. PROCEDURES

- A. Participants will turn in their vehicle to the display area at the beginning of the conference.
- B. Participants must launch their own vehicles
- C. Each vehicle will be launch once and timed. The top 16 vehicles will go to the next round.
- D. The subsequent rounds are single-elimination, head-to-head races with the winner advancing through the bracket.
- E. Vehicles will be returned to the display area at the end of the competition.

V. EVALUATION

The rubric on the following page will be used in the evaluation of this event. In the case of a tie, ranking will be determined by the most innovative design. The Event Coordinator will make this decision. In the case of a tie, ranking will be determined by the most innovative design. The Event Coordinator will make this decision.





RAT TRAP DRAG RACE (RUBRIC)

Rat Trap Drag Race - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

Trials: Record information about the time trail and placement on initial bracket

TIME: _____ **PLACEMENT ON INITIAL BRACKET:** _____

	10 Points	8 Points	6 Points	4 Points	TOTAL
Drawing	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the vehicle. It is to scale. Measurements are included.	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the vehicle, but is not to scale. Measurements are included.	Drawing may not be on 8.5" x 11" paper and reflects the design of the vehicle, but may not be accurate. It's not to scale. Measurements are not included.	Drawing is not neat, is not on 8.5" x 11" paper, is not accurate, or is missing. It is not to scale. Measurements are not included.	
Design Specs- Overall	The vehicle meets design specs for width and length. It remains in spec during the race.	Vehicle does not meet one of the specs for width or length. It remains in spec during the race.	Vehicle does not meet two of the specs for width and length or may not remain in spec for the duration of the race.	Vehicle does not meet the design specs for width and length and is out of spec for the duration of the race.	
Design Specs - Rat Trap	The vehicle is powered only by a single standard rat trap spring.	N/A	N/A	The vehicle is not powered only by a single, standard rat trap spring.	
Design Specs - Appearance	The vehicle is neatly constructed, using a proper amount of glue, tight fitting pieces, and cuts are clean. Vehicle is decorated/themed. Theme/decoration does not interfere with the operation of the vehicle.	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. Theme is not clear. Theme/decoration may occasionally interfere with operation of vehicle.	Vehicle has two needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Vehicle is decorated, but quality is lacking. Theme is not clear. Theme/decoration consistently interferes with the operation of the vehicle.	Vehicle has three needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Vehicle is not decorated or themed.	
Rules Violation: Contest judge(s) can deduct up to 18 points for a rules violation.					
Race Final Placement					
1st Place: 50 points	4th Place: 35 points	9th-12th Place: 20 points			
2nd Place: 45 points	5th-6th Place: 30 points	13-16th Place: 10 points			
3rd Place: 40 points	7th-8th Place: 35 points				
					TOTAL

RUBBERBAND POWERED CARS

STATE ONLY EVENT

I. PURPOSE

To allow students to demonstrate their ability to design and construct a vehicle powered only by a standard rubber band and propeller.

II ELIGIBILITY FOR ENTRY

This event is open to Middle School and High School Chapters. Entrants are limited to **SIX** (6) per school.

III. SPECIFIC REGULATIONS

- A. All entries must be designed and constructed before the conference.
- B. Cars must be turned into the event coordinator at the beginning of the conference to be displayed. Students may not pick up their cars until the end of the conference.
- C. Student must make car from scratch in the year it is raced. (No kits)
- D. Racers may use any commercial wheels, axles and props.
- E. Vehicle Specifications:
 - The car may not exceed 24 inches in length.
 - The car may not exceed 8 inches in width.
 - The car may not exceed 10 inches in height.
 - The car will be powered by no more than 2 – 12” loops of 3/16” wide rubber string loops.
 - The car must be designed so that an eyelet is placed at the front of the car, 1/4” from the floor.
- F. The track will be 20’ long x 15” wide. The surface of the track will be hotel-grade carpet.
- G. The cars will race against the stopwatch. Each car will race three times, and an average speed calculated.
- H. If the vehicle does not meet the specifications, it will have points deducted from the final score.

IV. PROCEDURES

- A. Participants will turn in their car to the display area at the beginning of the conference.
- B. Participants must launch their own cars

V. EVALUATION

The vehicle will be evaluated using the rubric on the following page. In the event of a tie, ranking will be determined by the most economically-produced model. The Event Coordinator will make this determination.





RUBBERBAND POWERED CARS (RUBRIC)

Rubberband Powered Cars - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

<p>Time Trials -- Calculated by: Distance (in inches) traveled / Time (in seconds)</p> <p>Speed Trial 1: _____" / _____ sec. = _____ / second</p> <p>Speed Trial 2: _____" / _____ sec. = _____ / second</p> <p>Speed Trial 3: _____" / _____ sec. = _____ / second</p> <p>TOTAL = _____ / 3 = (_____ / sec) x 10 = PUT TOTAL HERE >></p>		TOTAL		
	10 Points	8 Points	6 Points	4 Points
Drawing	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the vehicle. It is to scale. Measurements are included.	Drawing is neatly prepared on 8.5" x 11" paper and accurately reflects the design of the vehicle, but is not to scale. Measurements are included.	Drawing may not be on 8.5" x 11" paper and reflects the design of the vehicle, but may not be accurate. It's not to scale. Measurements are not included.	Drawing is not neat, is not on 8.5" x 11" paper, is not accurate, or is missing. It is not to scale. Measurements are not included.
Design Specs- Overall	The vehicle meets design specs for length, width and height. It has an eyelet screw placed at the front of the car 1/4" from the floor.	Vehicle does not meet one of the specs for width, length or height, or it may not have an eyelet screw correctly placed at the front of the car.	Vehicle does not meet two of the specs for width, length or height or may not have an eyelet screw placed at the front of the car.	Vehicle does not meet the design specs for width, length and height and does not have an eyelet screw at the front of the car.
Design Specs - Rat Trap	The vehicle is powered no more than 2 12" loops of 3/16" rubber string loops.	N/A	N/A	The vehicle is powered by a source other than the specified 2 12" loops of 3/16" rubber string loops.
Design Specs - Appearance	The vehicle is neatly constructed, using a proper amount of glue, tight fitting pieces, and cuts are clean. Vehicle is decorated/themed. Theme/ decoration does not interfere with the operation of the vehicle.	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. Theme is not clear. Theme/ decoration may occasionally interfere with operation of vehicle.	Vehicle has two needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Vehicle is decorated, but quality is lacking. Theme is not clear. Theme/ decoration consistently interferes with the operation of the vehicle.	Vehicle has three needs for improvement: glue usage, tight fitting pieces, and cuts are clean. Vehicle is not decorated or themed.
Race Final Placement	1st Place: 50 points 2nd Place: 45 points 3rd Place: 40 points	4th Place: 35 points 5th-6th Place: 30 points 7th-8th Place: 25 points	9th-12th Place: 20 points 13-16th Place: 10 points Did Not Finish = 0 points	PUT TOTAL HERE >>
Rules Violation:	Contest judge(s) can deduct up to 18 points for a rules violation.			
GRAND TOTAL				

T-SHIRT DESIGN

STATE ONLY EVENT

OVERVIEW:

Participants are required to develop and present a T-shirt screen design, which can be adopted, as the Colorado state delegation T-shirt to be worn at the National TSA conference. For the 2011 National Conference, the Colorado state delegation T-shirt should reflect Colorado TSA's 25th Anniversary.

I. PURPOSE

Provide a means for TSA members to demonstrate their ability to communicate design and layout skills.

II. ELIGIBILITY FOR ENTRY

This event is open to Middle School and High School Chapters. Entries are limited to **ONE** (1) per chapter.

III. SPECIFIC REGULATIONS

- A. The T-shirt design is an individual event. No recognition will be given for a group effort.
- B. The student should develop a design for the back of the t-shirt as well as an accompanying design for the front left pocket area of the shirt. The design for the back of the shirt should not exceed 20 cm (8") by 25 cm (10"), with the 25cm (10") dimension being the vertical measurement. The design for the front left pocket area of the shirt should not exceed 13cm (5") wide by 13cm (5") tall.
- C. The design may have a maximum of three colors.
- D. An original line type illustration(s) must be used that reflects or interprets or in some other way communicates the national conference theme.
- E. The following information **must** be included in the design:
 1. The words "TSA National Conference"
 2. Date of the National Conference
 3. Location of the National Conference (City & State)
 4. The theme for the 2011 National Conference T-shirt should reflect Colorado's 25th Anniversary.
 5. Either the Colorado TSA logo, or the official TSA logo
 6. The type face(s) may be original in design or may consist of a traditional-type style(s). The required alphanumeric characters may be incorporated as an integral part of the illustration.
- F. Prepare a printed T-shirt for the design. Shirt color is the choice of the participant but should be available in quantity.
- G. Clean, black-line copies of each color separation in the entire screen design **must** be submitted along with the printed-t-shirt.
- H. Public domain computer clip art may be included in the design. Use of copyrighted or registered artwork in design is prohibited without verified permission from the original artist/publisher
- I. Copies of previously submitted (winning or non-winning) designs shall not be used.



T-SHIRT DESIGN (CONTINUED)



IV. PROCEDURE

- A. Registration: Event participants must register and follow the guidelines for the event in accordance with the procedures established for the conference.
- B. No designs may be picked up before the assigned time.
- C. All winning entries will become the property of TSA, Inc.

V. EVALUATION

The designs will be evaluated using the rubric on the following page. In the event of a tie, ranking will be determined by the Event Coordinator. Note: Since only one design can be selected and utilized to promote the state of Colorado at the National conference, the top middle school and high school designs will be re-evaluated to determine the overall winning design for the national delegation t-shirt.

T-Shirt Design - Evaluation Sheet

NOTE: ALL DECISIONS BY THE JUDGE ARE FINAL

Contestant ID: _____

	10 Points	8 Points	6 Points	4 Points	TOTAL
Design Specs- Artwork	<p>T-shirt design is prepared neatly and in color. Design consists of no more than three colors (not including the color of the shirt). Design is presented on a T-shirt.</p> <p>Artwork is clear and all elements are distinct and easily readable/recognizable. Design includes:</p> <ul style="list-style-type: none"> • The words "TSA National Conference" • The Colorado TSA logo or official TSA logo • Dates of the Nat'l Conference • Location of the Nat'l Conference • The theme of the design reflects Colorado TSA's 25th Anniversary • The words "Colorado TSA" 	<p>T-shirt design in color. Design consists of no more than three colors (not including the color of the shirt). Design may not be presented on a T-shirt.</p> <p>Artwork is clear and all elements are readable/recognizable. Design may be missing one of the following elements:</p> <ul style="list-style-type: none"> • The words "TSA National Conference" • The Colorado TSA logo or official TSA logo • Dates of the Nat'l Conference • Location of the Nat'l Conference • The theme of the design reflects Colorado TSA's 25th Anniversary • The words "Colorado TSA" 	<p>T-shirt design is poorly prepared or consists of more than 3 colors (not including the color of the shirt). Design is not be presented on a T-shirt.</p> <p>Artwork is not clear and not all elements are readable/recognizable. Design may be missing two or more of the following:</p> <ul style="list-style-type: none"> • The words "TSA National Conference" • The Colorado TSA logo or official TSA logo • Dates of the Nat'l Conference • Location of the Nat'l Conference • The theme of the design reflects Colorado TSA's 25th Anniversary • The words "Colorado TSA" 	<p>T-shirt design is poorly prepared, is not in color, or has more colors than specified. It is not presented on a T-shirt.</p> <p>Artwork is not clear and all elements are not readable/recognizable. Design may be missing two or more of the following:</p> <ul style="list-style-type: none"> • The words "TSA National Conference" • The Colorado TSA logo or official TSA logo • Dates of the Nat'l Conference • Location of the Nat'l Conference • The theme of the design reflects Colorado TSA's 25th Anniversary • The words "Colorado TSA" 	
Design Specs- Documentation	<p>The artwork reflects, interprets, or in some other way communicates the theme of COTSA's 25th Anniversary. Design also includes some element that reflects, interprets or in some other way communicates a sense of the 25th Anniversary theme.</p> <p>The design is accompanied by clean black-line copies of each color separation in the entire screen design.</p> <p>The design is accompanied by documentation of where the artwork was obtained, with permission from the original artist/publisher if applicable.</p>	N/A	N/A	<p>The artwork DOES NOT reflect, interpret or in some other way communicate the theme of the national conference. Design also does not include some element that reflect, interprets or in some other way communicates a sense of the specified theme as outlined in the rules.</p> <p>The design is not accompanied by clean black-line copies of each color separation in the entire screen design.</p> <p>The design is not accompanied by documentation of where the artwork was obtained.</p>	
Design Specs - Size	<p>Back design is <20cm x 25 cm; front design is <13cm x 13 cm.</p>	N/A	N/A	<p>Back design is >20cm x 25 cm; front design is >13cm x 13 cm.</p>	
Rules Violation: Contest judge(s) can deduct up to 12 points for a rules violation.					
TOTAL					





MIDDLE SCHOOL EVENT SUMMARIES

PLEASE NOTE: These are only brief summaries about the events available to students. For detailed information about each of the events, please consult the official Middle School National TSA Conference Competitive Events Guide. Please be sure to carefully read the event descriptions, regulations and procedures in the National TSA Competitive Events Guide.

Additionally, contest updates may occur throughout the school year and are available at: www.tsaweb.org/Updates-and-Clarification

Themes for several events will be posted on the National TSA website at: www.tsaweb.org/Themes-and-Problems

***NOTE: Number of entries listed here are only applicable to the Colorado TSA State Conference; entries permitted at the National TSA Conference are listed in the National TSA Competitive Events Guide.*

NATIONAL EVENTS

Agriculture and Biotechnology Issues – Participants choose a challenging contemporary issue related to agriculture and biotechnology, and demonstrate understanding of the issue by documenting their research and creating a display. **Three (3) teams of two (2) per chapter.**

Career Prep – Participants conduct research on a selected technology-related career and use the knowledge gained to prepare a resume and cover letter, to complete a job application, and to participate in a mock interview- See National Competitive Events Guide for this year's theme. **Three (3) students per chapter.**

Challenging Technology Issues – Team members work together to present opposing views of a current technology issue. Team prepares and delivers an extemporaneous debate-style presentation with team members explaining opposing views of a current technology issue that has been selected from a choice of three (3) issues provided on-site. **Three (3) teams of two (2) per chapter.**

Chapter Team – Parliamentary procedure competition. **One (1) team of six (6) per chapter.**

Communication Challenge – Contestants design and produce a newsletter that promotes the chapter's activities, an effective sponsor support request on chapter letterhead, and a business card. Semifinalists work creatively under constraints in designing a solution to a problem given on site. **Three (3) students per chapter.**

Construction Challenge – Teams identify a community need related to construction and then plan and implement a course of action that involves students and community members. **Three (3) teams of two (2) per chapter.**

Digital Photography – Participants produce and submit an album of digital photographs. Finalists are assigned a task on site. **Six (6) students per chapter.**

Dragster – Participants design, produce working drawings for and build a CO₂-powered dragster. **Three (3) students per chapter.**

Electronic Gaming – Participants develop an E-rated game that focuses on the subject of their choice. The game should be interesting, exciting, visually appealing and intellectually challenging. The game should have high artistic, educational and social value. A working, interactive game will be submitted for evaluation. **Three (3) teams per chapter. There will be a minimum of two (2) participants per team.**

MS NATIONAL EVENT SUMMARIES (CONTINUED)

**** UPDATE Engineering Structure** – Participants use basic engineering techniques to evaluate designs they have modeled and tested. Each team researches, designs and tests models to determine superior engineering. On site, students are given a specified span and must plan and construct a model using supplied materials. The model is then submitted for destructive testing. **Two (2) teams of two (2) per chapter.**

Environmental Focus – Participants identify & research a specific environmental problem or issue that has been influenced by advancements in technology. They gather information, analyze data, develop strategies and submit conclusions relative to the specific problem or issue. Students present their findings in the form of a multimedia presentation. **One (1) team per chapter but limited to two (2) student representatives for finalist review.**

Flight – Competitors design, build and test fly model gliders. Then, on site, using materials provided, participants build a glider that stays in flight for the greatest elapsed time. A catapult (which will be provided at competition) will launch the plane. **Six (6) students per chapter.**

Global Manufacturing – A TSA chapter, working with at least two (2) other TSA chapters, designs, manufactures and packages a marketable mass-produced product. Two (2) completed products will be included in the display for this event. **One team from the TSA chapters involved with a maximum of six (6) students on the team (no more than two (2) per chapter).**

Go Green Manufacturing – Participants identify a consumer need and manufacture a marketable product using recycled material that has been donated from business or industry. The chapter submits documentation of chapter activities and two (2) product samples made during the manufacturing experience. **Two (2) teams of three (3) students per chapter.**

Graphic Design – Participants plan and layout a graphic design that includes the theme for the next year's conference and that could be used in national TSA conference publications. **Six (6) students per chapter.**

Inventions and Innovations – Participants investigate and determine the need for an invention and innovation of a device, system or process. The team then documents possible solutions and creates a prototype or model, develops a stand-alone multimedia presentation, and documents work completed as they prepare to promote and demonstrate their idea for the invention/innovation. **Three (3) teams per chapter.**

Leadership Strategies – Participants work in teams to develop a plan of action that addresses a specific challenging situation provided on site. Under time constraints, semifinalists develop a plan for a second situation and then make a team presentation. **Three (3) teams of three (3) per chapter.**

Lights, Camera, Action – Participants develop and generate a detailed storyboard, production plan and a finished video that depicts the current year's theme as printed in the competitive events guide. **One (1) entry per chapter.**

Medical Technology Issues - Participants conduct research on a contemporary medical technology issue of their choosing, document their research, and create a display. **Three (3) teams of two (2) per chapter.**

Multimedia Production – Participants use their creative skills to produce a stand-alone multimedia presentation that promotes or details an aspect of TSA centered on a given theme. **Six (6) students per chapter.**

Prepared Speech – Participants deliver an oral presentation that reflects a theme which appears in the official competitive events guide. See the National Competitive Events Guide for this year's theme. **Three (3) students per chapter.**





MS NATIONAL EVENT SUMMARIES (CONTINUED)

- ** UPDATE Problem Solving** – Participants use their skills in problem-solving to develop a finite solution to a state problem provided on-site. You won't know what this one is until you show up! **Two (2) teams of two (2) members per chapter.**
- Robot TOBOR** – Participants design, fabricate, test, record the design and work efforts, and demonstrate the use of a remote-controlled robot that can complete a course and perform a designated task. **Three (3) teams of two (2) members per chapter, one (1) entry per team.**
- System Control Technology** – Participants use a team approach to develop a computer-controlled model solution to a given problem - usually from an industrial setting. Students may use Legos, Fischer techniques or LASY systems to build and program the solution on-site. **One (1) team of three (3) per chapter.**
- Technology Bowl Challenge** – A team of three (3) students complete a written test and then compete in a head-to-head competition similar to “Jeopardy” where students “buzz-in” and answer technical questions orally. **One (1) team of three (3) per chapter.**
- Technical Drawing** – Participants demonstrate an ability to read and interpret technical sketches and drawings, and to use materials in completing a technical drawing and illustration test. Semifinalists demonstrate their ability to solve an on-side technical drawing problem using standard sketching, drafting, and problem-solving techniques. **Six (6) students per chapter.**
- Techno Talk** – Students who have been randomly paired [one (1) team of two (2) students from one school with a team of two (2) students from another school, in order to form one (1) team of four (4) members at the conference] must demonstrate creativity and communication skills by building a structure and then replicating it through the use of a short message service (SMS)/text messaging device. **Three (3) teams of two (2) members each per chapter.**
- Transportation Challenge** – Participants design, engineer and fabricate an all-terrain hover craft that can traverse an obstacle course in the shortest amount of time. **Six (6) students per chapter.**
- TSA Cup: Marine Design Challenge** – Participants will develop a model of a propeller-driven race boat (which has an affiliation with a country) fitting a particular theme that is then tested and raced in a water tank. Participants will construct a display that features the team's chosen country and its boat. **Three (3) teams with at least two (2) members per chapter.**
- Website Design** – Participants are required to design, build and launch a World Wide Web site that features the team's ability to conduct research about a cutting edge science, technology, engineering or mathematics-related topic. *Early Deadline: For the state conference, all url's must be sent to tony.raymond@cccs.edu by Friday, January 28, 2011; for the national conference deadline, please consult the official competitive events guide.* **One (1) team of (3) three to (5) five members.**
- Write Now! Technical Writing** – Participants conduct research in two (2) or three (3) specified subtopics of a broader technological area and, using the knowledge and resources gained through that research, write a competitive report on the one (1) subtopic that is designated on-site. **Three (3) individuals per chapter.**
- Zap It! Electrical Applications** – Through a written test, the participants demonstrate a knowledge of basic electrical and electronic theory, as well as the use of a multimeter. Semifinalists are given a circuit to assemble on-site. **Three (3) students per chapter.**

MIDDLE SCHOOL STATE-ONLY EVENTS

Castle Ballistics -- Teams work to design a catapult, ballista or trebuchet to launch a hackey-sack/footbag at three randomly placed targets within a specified area. **Limited to two (2) teams of three (3) per chapter.**

Crash Test – Teams will design and build a “crash test” car that will be tested in multiple head –on and rear-end collisions. . **Ten (10) teams of two (2) students per chapter. Each team MUST include one (1) MS and one (1) Elementary student (grades 1-5).**

Middle School Creativity Challenge – Design teams, composed of one middle school student and one elementary student, work to solve an on-site problem. **Ten (10) teams of two (2) students per chapter. Each team MUST include one (1) MS and one (1) Elementary student (grades 1-6* See rules for more information).**

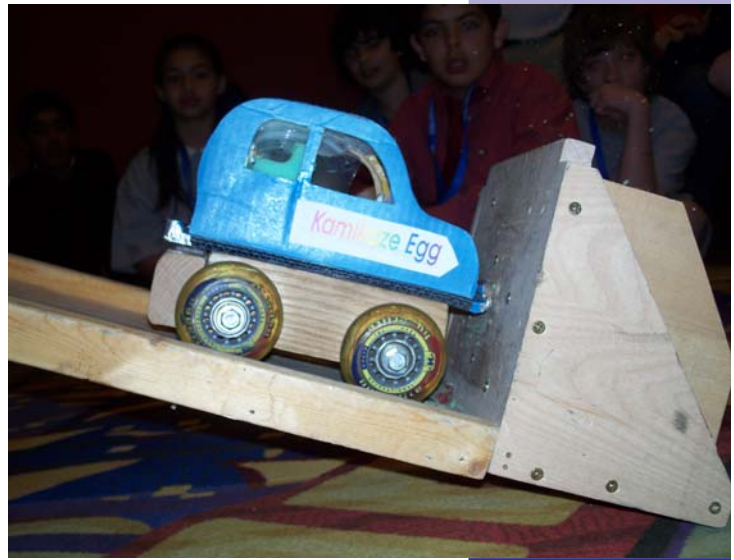
Mousetrap Tractor Pull – Participants design, build and test a model vehicle powered only by a standard mousetrap. The vehicle is tested by having it pull as much weight as possible over a set distance. **Six (6) students per chapter.**

**** UPDATE Pin Design** – Participants design a mock-up for the Colorado trading pin to be used at the national conference. The high school winner will be one of two trading pins produced for the national conference. **Six (6) entries per chapter.**

Project Showcase – The project showcase allows students to display “show-worthy” projects they have created within the past school year and may not fit into any other category. Students do not receive medals and do not earn points towards chapter of the year award for this event. **Ten (10) entries per chapter.**

Rubber Band Powered Cars – Participants design, build and then race a rubberband-powered propeller car. **Six (6) students per chapter.**

**** UPDATE T-shirt Design** – Participants design the Colorado delegation’s national conference T-shirt. The winner between the middle and high school top finishers will become the state delegation T-shirt. **One (1) per chapter.**





HIGH SCHOOL EVENT SUMMARIES

PLEASE NOTE: These are only brief summaries about the events available to students. For detailed information about each of the events, please consult the official High School National TSA Conference Competitive Events Guide for 2011-2012. Please review ALL events to ensure that student projects meet the criteria as outlined in the current rule book.

Periodically throughout the year, national TSA will post updates and changes to the rules on their website. Please be sure to stay abreast of the latest changes/updates by visiting the site regularly.

*Contest updates and clarifications can be found at:
www.tsaweb.org/Updates-and-Clarification*

*Themes for several events will be posted on the National TSA website at:
www.tsaweb.org/Themes-and-Problems*

*Events which are new are marked as ****NEW**. Events which may have been modified, including a name change (e.g., from “Cyberspace Pursuit” to “Webmaster”), or the number of entrants allowed at the state conference, are marked as ****UPDATE**.*

***NOTE: Number of entries listed here are only applicable to the Colorado TSA State Conference; entries permitted at the National TSA Conference are listed in the National TSA Competitive Events Guide.*

NATIONAL EVENTS

Animatronics – Participants work as a team to 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 surrounding environment are to accompany the device. **Three (3) teams of three (3) per chapter.**

Architectural Model – Participants develop a set of architectural plans and related materials for an annual architectural design challenge and construct an architectural model to accurately depict their design. In 2011, participants design a museum for manual arts, industrial arts and technology education. **Six (6) entries (individual or team) per chapter.**

**** UPDATE - Biotechnology Design** – Participants select a contemporary biotechnology problem that relates to the current year’s published area of focus and demonstrate understanding of it through documented research, the development of a solution, a display, and an effective multimedia presentation. If appropriate, a model or prototype of the solution may be included in the display. Participants may choose to recreate or simulate research that previously has been performed within the scientific community. The biotechnology area of focus for 2011 is Genetic Engineering. **Three (3) teams of two (2) per chapter.**

Career Comparisons - Participants thoroughly research various technology-related careers associated with one of the technology areas listed in the national competitive events guide. After documenting the research, each participant must submit a cover letter and resume for one of the careers and complete a job application on site. Semifinalists also participate in an on-site job interview. **Six (6) students per chapter.**

Chapter Team – Parliamentary procedure competition. **One (1) team of six (6) per chapter.**

**** UPDATE - Computer Aided Design - 2D Architecture** – Students will compete on site to solve a given problem. Participants create representations, such as foundation and/or floor plans, and/or elevation drawings, and/or details of architectural ornamentation or cabinetry. *NOTE: Participants may compete in CAD 2D, Architecture or CAD 3D, Engineering, but not both.* **Four (4) students per chapter with only one (1) CAD event per student.**

HS NATIONAL EVENT SUMMARIES (CONTINUED)

**** UPDATE - Computer Aided Design - 3D Engineering** – Students will compete on site to solve a given problem. Participants create a 3D computer model(s) of an engineering or machine object, such as a machine part, tool, device, or manufactured product. *NOTE: Participants may compete in CAD 2D, Architecture or CAD 3D, Engineering, but not both.* **Four (4) students per chapter with only one (1) CAD event per student.**

**** NEW - Construction Renovation** – Participants develop a set of presentation boards to include plans, illustrations and finishes for a specified space. The solution must include all applicable construction systems. **Three (3) teams of two (2) per chapter.**

Debating Technological Issues - Team members work together to prepare for a debate against a team from another chapter. The teams will be instructed to take either the pro or con side of the designated topic published in the national competitive events guide. **Entries are limited to one (1) team of two (2) members per chapter.**

Desktop Publishing – Participants develop a notebook, a tri-fold pamphlet, a three (3)-column newsletter, and a poster. All participants (not just semifinalists) then work to solve an on-site problem that demonstrates their abilities to use the computer to design, edit, and print materials for publication. The theme for 2011 is *A Whole New World*. **Six (6) students per chapter.**

**** NEW - Digital Video Production** - Participants develop a digital video/film that focuses on the given year's theme. Sound may accompany the film. The theme for 2011 is Drama. **One (1) team per chapter.**

Dragster Design – Participants design, produce working drawings for, and build a CO₂- powered dragster. **Three (3) students per chapter.**

Engineering Design – Participants work as part of a team to solve a design problem. Through use of a model/prototype, display, and design notebook, the team explains in detail how it has solved the problem and the solution's impact on society and the environment. Semifinalists demonstrate the problem and solution in a timed presentation. **Three (3) teams of three to five (3-5) people per chapter.**

Essays on Technology – Participants conduct research in a published technological area and, using the knowledge and personal insights gained from this research, write a persuasive essay on one (1) subtopic selected from two (2) or three (3) related subtopics designated on site. **Three (3) students per chapter.**

Extemporaneous Presentation – Participants give a three to five (3-5) minute speech fifteen (15) minutes after having drawn a card on which a technology or TSA topic for their speech is written. **Three (3) students per chapter.**

Fashion Design - Students have the opportunity to research, develop, and create garment designs, garment mock-ups, and portfolios that reflect the current year's published theme. Twelve (12) qualifying semifinalist teams participate in an on-site event in which they present their potential garment designs to the judges on a TSA runway. The theme challenge for 2011 is to design two (2) costumes for a current Broadway play of the team's choice. **One (1) team of two to four (2-4) members per chapter.**



HS NATIONAL EVENT SUMMARIES (CONTINUED)



Flight Endurance – Build an airplane (ahead of time) to stay in the air the longest amount of time. This plane must rise off the ground (R.O.G.) on its own. **Six (6) students per chapter.**

Future Technology Teacher - Participants research and select three (3) accredited colleges or universities that offer technology education/engineering technology teacher preparation as a major. Each participant will write no more than one (1) page (simulated college essay) explaining why s/he would like to become a technology education/engineering technology teacher and what would constitute success in the field. In addition, each participant will develop and present a one (1)-class period activity (with a lesson plan) using the ITEEA standards for technological literacy. **Three (3) individual students per chapter.**



Manufacturing Prototype – Participants design and manufacture a prototype of a product and provide a description of how the product could be manufactured in a state-of-the-art American manufacturing facility. The product for 2011 is TSA officer symbols, plus the gavel and block. **Two (2) entries per chapter.**

Music Production - Participants produce an original musical piece that is designed to be played during the national TSA conference opening or closing general sessions. The musical piece should be energizing, interesting and of a spirit consistent with the Technology Student Association. **One (1) team per chapter.**

**** UPDATE - On Demand Video** - Participants write, shoot, and edit a short video during the conference in this on-site event. Required criteria, such as props and a line of dialogue, make the competition more challenging and will be revealed at the event orientation meeting. *NOTE: Due to the length of the state conference, this event will be shortened at state to fit within the allotted time.* **One (1) team of two (2) or more students per chapter.**

**** NEW - Photographic Technology** – Students capture images and process photographic and digital prints that depict the current year's published theme. Twelve (12) qualifying semifinalists participate in an on-site event in which they capture digital images and utilize multimedia software to prepare a storyboard/outline and media presentation of newsworthy TSA conference activities and events. The theme for 2011 is Doors. **Six (6) students per chapter.**

Prepared Presentation – Participants deliver an oral presentation that includes audio and/or visual enhancement based on the theme for the current year's conference. The theme for the 2011 conference is Snapshot of Innovation. **Three (3) students per chapter.**

**** UPDATE - Promotional Graphics** – Participants develop and present a graphic design that can be used to promote participation in TSA competitive events. The design will promote competitions offered in the TSA competitive events guide. Participants will choose one (1) of the three (3) competitions listed in the national competitive events guide. **Six (6) students per chapter.**

SciVis – Participants develop a visualization focusing on a subject or topic from one (1) or more of the following areas: science, technology, engineering or mathematics. **Three (3) per chapter.**

**** UPDATE - Structural Engineering** – Participants work as part of a team on site with supplied materials to build a model of a structure that is destructively tested to determine design efficiency. **Two (2) teams of two (2) per chapter.**

HS NATIONAL EVENT SUMMARIES (CONTINUED)

System Control Technology – Participants work as part of a team on-site to develop a computer-controlled model-solution to a problem, typically one from 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 evaluators to operate the device. **One (1) team of three (3) per chapter.**

Technical Sketching and Application – Participants complete a written test in order to qualify as semifinalists. Semifinalists then demonstrate their ability to solve on-site engineering graphics problems using standard drafting techniques. **Six (6) individuals per chapter.**

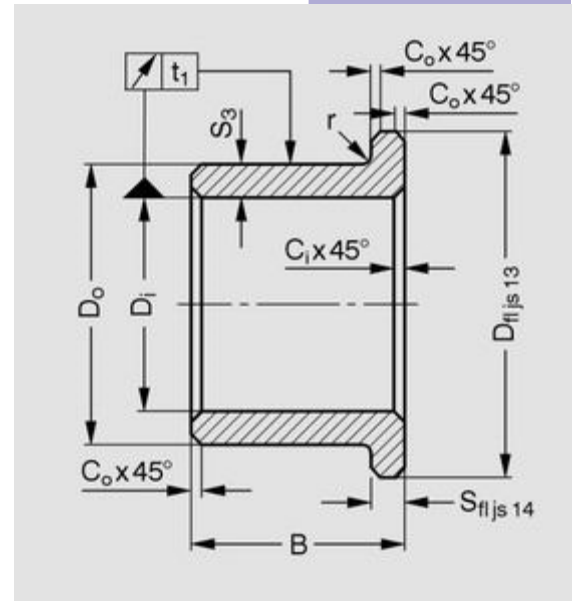
Technology Bowl – A written test followed by a knowledge bowl format like “Jeopardy” where students “buzz-in” and answer technical questions orally. **One (1) team of three (3) students per chapter.**

**** UPDATE - Technology Problem Solving** – Participants work together to develop and create a solution to a problem using the limited materials provided and the tools allowed. Completed solutions will be objectively measured and judged to determine the best and most effective solution for the stated problem. Participants won’t know what this one is until they show up! **Two (2) teams of two (2) per chapter.**

Transportation Modeling – Participants use engineering skills to design and fabricate a CO₂-powered scale model of a vehicle that meets the current year’s stated design theme. The design theme for 2011 is a custom golf cart. **Three (3) students per chapter.**

**** UPDATE - Video Game Design** – Participants develop an E-rated game that focuses on the subject of their choice. The game should be interesting, exciting, visually appealing and intellectually challenging. The game should have high artistic, educational, and social value. A working, interactive game will be submitted on a DVD for evaluation. **Three (3) teams of two (2) students per chapter.**

**** UPDATE - Webmaster** – Participants are required to design, build and launch a World Wide Web site that features the school’s career and technology education program, the TSA chapter, and the chapter’s ability to research topics pertaining to technology. Conference semifinalists participate in an on-site interview to demonstrate the knowledge and expertise gained during the development of the website with an emphasis on Internet and web history, web design (school, chapter and design brief pages), and research about cutting edge advances in technology. **NOTE: Early Deadline: All url’s must be sent to tony.raymond.ccs.edu by Friday, January 28, 2011. One (1) team of three to five (3-5) members.**





HIGH SCHOOL STATE-ONLY EVENTS

- Castle Ballistics** – Teams work to design a catapult, ballista or trebuchet to launch a hackey-sack/footbag at three randomly placed targets within a 36' x 36' area. **Limited to two (2) teams of three (3) per chapter.**
- Fore!** – Teams, composed of one high school student and one elementary student, design and develop one hole for a proposed miniature golf course. **Ten (10) teams of two (2) students per chapter. Each team MUST include one (1) HS and one (1) elementary student (grades 1-5).**
- High School Creativity Challenge** – Design teams, composed of one high school student and one elementary student, work to solve an on-site problem. **Ten (10) teams of two (2) students per chapter. Each team MUST include one (1) HS and one (1) elementary student (grades 1-6* See rules for more information).**
- Hydrodynamics** – Participants design, build and test a model boat powered by a rubber band. **Six (6) students per chapter.**
- ** NEW - Integrated Autonomous Vehicle** - Participants create and operate an integrated autonomous vehicle. The vehicle will operate in a number of courses, but must be able to navigate a course without prior knowledge of distance or direction within a chosen course. Two separate modes of operation will be used: Student-controlled and Autonomous. **Two (2) teams of three (3) members per chapter.**
- ** UPDATE Pin Design** – Participants design a mock-up for the Colorado trading pin to be used at the national conference. The high school winner will be one of two trading pins produced for the national conference. **Six (6) entries per chapter.**
- Project Showcase** – Project showcase allows students to display “show-worthy” projects they have created within the past school year and may not fit into any other category. Students do not receive medals and do not earn points towards chapter of the year award for this event. **Ten (10) entries per chapter.**
- Rat Trap Drag Races** – Use a standard rat trap to power a vehicle down a track as fast as possible. **Six (6) students per chapter.**
- Rubber Band Powered Cars** – Participants design, build and then race a rubberband-powered propeller car. **Six (6) students per chapter.**
- ** UPDATE T-shirt Design** – Participants design the Colorado delegation’s national conference T-shirt. The winner between the middle and high school top finishers will become the state delegation T-shirt. **One (1) per chapter.**

