

Technology Competitions and Exhibits

Technology Student Association and Events - Division 6

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Entry Form accepted from October 21, 2019 to January 14, 2020.

Check In:	February 27, 2020, 4:00 PM to 8:00 PM in Arnold Hall.
	February 29, 2020, 10:00 AM to 4:00 PM in Arnold Hall.
Check Out:	April 9, 2020, 4:00 PM to 8:00 PM in Arnold Hall.
Group Entries:	As Indicated
Competition Date:	Sunday March 15, 2020, 12:30 pm in Arnold Hall.

Special Note: Please be sure to check The Fair website for any updates to the rules. Teachers, it is requested that if you are bringing entries for your class that they be at the check-in area by 1:00 PM

This division was developed for students enrolled in Technology Education classes in the middle and high school level. Although open to all students, it is advisable that exhibitors check with a Technology Education teacher for an explanation of criteria.

The Technology Student Association Division will award an outstanding trophy for each level (middle, senior, middle exceptional and senior exceptional) based upon the following criteria:

- Each entry in this division receiving a blue ribbon will be awarded five points.
- Each entry in this division receiving a red ribbon will be awarded three points.
- Each Metric 500 car that qualifies for the double elimination race competition (based upon speed) will receive three additional points.
- Each entry in this division receiving a purple ribbon will be awarded an additional five points.

There are four levels for students to enter in the Technology Student Association Division. There will be separate awards for each level.

Level I – Middle School

Level II– High School

Level III – Exceptional Education middle school (same rules as middle school)

Level IV – Exceptional Education high school (same rules as high school)

Class 601 - Dragster (Level I) - Metric 500

Class 602 - Dragster Design (Level II) - Metric 500

Class 603 - Dragster (Level III) - Metric 500

Class 604 - Dragster Design (Level IV) - Metric 500

The design and construction of a CO2 powered model dragster. All qualifying exhibit cars entered in all levels take part in “The Metric 500 Qualifying Time Trials” which will take place at The Youth Fairgrounds during project check-in.

Racing Dates:

Levels I, II, III and IV – TIME TRIALS (DURING PROJECT CHECK-IN)

Level I & III Middle School Students – Race, March 15, 2020 12:30pm

Level II & IV High School Students – Race, March 15, 2020 12:30pm

Participants will be notified of the race dates via email or confirmation card via US Mail.

Racing Procedures:

1. Only cars evaluated by the judges and deemed properly and safely constructed will be run.
2. Each car will run one Time Trial at check-in to determine its “qualifying time.”
3. The sixteen fastest cars that meet the required specifications will advance to the double elimination race competition for the appropriate level.
4. The race results will be determined using the TSA “double elimination” sheet which can be obtained upon request.

Rules:

1. Individual entries only. No class/club entries will be accepted.
2. Only one car may be entered per student.
3. Entries must be accompanied by a copy of your entry form and computer tag. The entry number MUST be written on the bottom of the car with a marker in a contrasting color to the paint/finish of the car.
4. CO2 cartridges will be provided by The Youth Fair.
5. All cars must have a finish (paint, stain, varnish, etc.).
6. HIGH SCHOOL ONLY: The dragster body must include at least one (1) wing, spoiler, fin or splitter as part of the finished product. It must be part of the one-piece body, not an add-on or additional piece, and must stay within all other regulated specifications as outlined in the event regulations.

Regulations:

Dragsters that do not meet the following specifications/tolerances are disqualified from the race.

1. Dragster Body:

DB1- One piece, all wood construction. Any type of lamination will result in disqualification. No add-ons such as body strengtheners, fenders, plastic canopies, exhausts, or air foils may be attached to, or enclosed, within the vehicle. Fiberglass and shrink wrap are considered body strengtheners and cannot be used on car body or wheels for any reason. Decals may be used for decoration only. They may not be used to gain aerodynamic advantage, (i.e., decals cannot cover the exterior axle holes or to be used to cover open area of the body). Two or more like or unlike pieces of wood glued together are not considered one-piece, all wood construction.

	MINIMUM	MAXIMUM
DB2 - Body length Middle School	230 mm.....	240 mm
DB2 - Body length High School.....	295 mm.....	305 mm
DB3 - Body height with wheels		75 mm

DB4 - Body mass (completed car without CO ₂)		
Middle School.....	35 g.....	65 g
Senior High School.....	55 g.....	N/A
DB5 - Body width at axles, front and back.....	35 mm	42 mm
DB6 - Body total width (including wheels)		90 mm
	MINIMUM	MAXIMUM

2. Axles/Axle Holes/Wheelbase:

- A1 - Dragsters must have two axles per car, no more.
- A2 - Bottom of axle hole/bearing above bottom of car body 5 mm 10 mm (measured at side)
- A3- Rear axle hole from rear of car.....9 mm..... 100 mm
- A4- Wheelbase MS (axle distance apart at farthest point)105 mm 222 m m
- A4- Wheelbase HS (axle distance apart at farthest point)105 mm..... 270 mm
- A5 - Bearings, bushings and lubricants may be used.
- A6 - Glue may be used to secure bearing to body.

3. Spacer Washer/Clips:

- S1 - Spacer washer (middle school)10
- S2 - Axle clips (middle school)..... 4
- S1 - Spacer washer (high school)8
- S2 - Axle clips (high school).....8
- S3 - Silicone or any other type of glue/adhesive may not be used in place of wheel clips to hold wheels or axles in place.

4. Power Plant (CO₂ Cartridge Hole):

P1- The power plant hole must be at the farthest point at the rear of the car and must be drilled parallel to the race surface to assure proper puncture of the CO₂ cartridge. A minimum of 3mm thickness around the entire power plant hole must be maintained on the dragster for safety. The inside of the power plant hole must not be painted.

- P2 - Hole depth.....45 mm..... 55 mm
- P3 - Safety zones thickness
- P3 - Safety zones thickness
- P3 - Safety zones thickness3 mm..... N/A
- P4 - Chamber diameter19 mm..... 20 mm
- P5 - Lowest point of chamber diameter to race surface (with wheels) 26mm..... 40mm

5. Eye Screws (Should be glued in to prevent their coming out during the race):

ES1 - Dragsters must have no more than two eye screws per car that meet tolerances. They must not make contact with the racing surface. The track string must pass through both screw eyelets, which are located on the center line of the bottom of the car. Glue may be used to reinforce the eye screws. It is the responsibility of the car designer/engineer to see the eye screw holes are tightly closed to prevent the track line from slipping out as with all adjustments, this must be done prior to event check-in.

- ES2 - Inside diameter.....3 mm..... 5 mm
- ES3 - Distance apart (at farthest points) 150 mm..... 270 mm

6. Wheels, Middle School ONLY:

W1 - A dragster must have no more than four wheels. Each wheel must meet regulations W2 and W3. All four wheels must touch the racing surface at the same time. All wheels must roll. Wheels must be made entirely from plastic. Dimensions must be consistent for full circumference of the wheel.

- W2 - Wheel Diameter30 mm..... 40 mm
- W3 - Wheel width (at surface contact point)2 mm..... 18mm

Wheels, High School ONLY:

W1 - A dragster must have no more than four wheels. Two must meet rules W2 and W3. The other two must meet rules W4 and W5. All four wheels must touch the racing surface at the same time. All wheels must roll. Wheels must be made entirely from plastic. Dimensions must be consistent for full circumference of the wheel.

	MINIMUM	MAXIMUM
W2 - Front diameter	32 mm.....	37 mm
W3 - Front width (at surface contact point).....	1.5 mm	5 mm
W4 - Rear diameter	35 mm.....	40 mm
W5 - Rear width (at surface contact point)	12 mm.....	18 mm

- All contest entries will be judged according to the Research and Design Judging Sheet for the appropriate level (see judging criteria below).
- All entries in this division will receive awards as listed below.
- The decision of the judges will be final.
- For further information or a sample judging sheet, refer to the National TSA Conference Competitive Events Guide or contact the Technology Education Instructional Supervisor for Miami-Dade County Public Schools at (305) 693-3030.
- These rules are for The Youth Fair only and may not meet the TSA Competitive Event guidelines.
- No repair or maintenance is allowed after entries have been registered. Any entry damaged during the race is evaluated by the event superintendent to determine whether or not the vehicle is allowed to race again. In the event that the vehicle is damaged by event personnel, the superintendent rules as to whether the vehicle may be repaired. Undamaged wheels that come off during the event may be replaced as determined by the superintendent. Damaged wheels may not be replaced.

Judging Criteria:

For ribbons: design, construction, and finish of the car.

For Trophies, the following:

All entries maximum points awarded are: Dragster body production quality, body paint/finish, and vehicle assembly.....	30 Points
Race Results	
1st Place.....	55 Points
2nd Place.....	50 Points
3rd Place	45 Points
4th Place	40 Points
5th and 6th Place	35 Points
7th and 8th Place	30 Points
9th - 12th Place	25 Points
13th – 16th Place Middle School.....	20 Points
13th – 16th Place High School	15 Points

RACE TROPHIES:

There will be three trophies awarded to students at each level (a first place, second place, and third place trophy) based on the judging criteria listed above.

Class 605 - Promotional Marketing (Level I)**Class 606 - Promotional Marketing Exceptional Education (Level III)**

Middle School participants will design a promotional poster for The Youth Fair.

Rules:

1. Individual entries only; no class/club entries will be accepted. All work must be done by the individual student during the current school year.
2. One entry may be entered per student.
3. Use of copyrighted or registered trademark artwork in the design is prohibited without verified permission from the original artist/publisher.
4. The promotional poster must include the dates of the 2020 Fair, March 12 – April 5, and the logo. To obtain the logo in digital format please contact Cristina Delgado-Ruiz, Supervisor for Technology Education, via email at cdelgado@dadeschools.net.
5. The design must be presented in portrait or landscape layout.
6. Each design must be a color computer-generated design that is printed on 8.5" x 11" paper that is mounted on black mat or poster board not to exceed 14" x 22".
7. Entries which do not adhere to rules may be disqualified from judging. Only designs receiving blue and red ribbons will be displayed.

Judging Criteria:

Designs will be evaluated for creativity and effectiveness to communicate a message, neatness, and technical quality using the following rubric:

1-30 points – Inspiration for graphic design, design process, and relevance

1-70 points – First impression of graphic, graphic appropriateness, dominance, balance and proportion, and incorporation of graphic design principals.

For further information or a sample judging sheet, refer to the National TSA Conference Competitive Events Guide or contact Cristina Delgado-Ruiz, Technology Education Instructional Supervisor for Miami-Dade County Public Schools at (305) 693-3030.

Class 607- Promotional Design (Levels II)**Class 608 - Promotional Design (Levels IV)**

Participants have the opportunity to use computerized graphic communications layout and design skills in the production of a promotional resource for TSA.

Participants produce an original, multi-piece marketing portfolio to be used for TSA chapter recruitment, or as an introductory packet for new TSA advisors/teachers. This promotional packet would be mailable and would include four to five (4-5) separate and different items. The packet must provide details about TSA, its history, its co-curricular relationship with Engineering and Technology pathway courses, its membership guidelines and instructions for joining, the competitive events program, signature events, service projects, STEM connections, leadership training activities, and sample chapter membership recruitment items. Portfolio examples might include: a pamphlet, post card, letter, small poster, business card, and a PDF of a color graphic for branding promotional gifts. The complete portfolio must demonstrate a unity of design that repeats throughout the included items.

Rules:

1. The Promotional Design event is an individual event. No recognition is given for a group effort.
2. The design must meet the following criteria:
3. The design must be produced using a desktop publishing system, e.g. Photoshop, InDesign, Illustrator etc. Scanned original art may be included.
4. The design must be original and reflect, interpret, or in some other way communicate the essence of the challenge provided for the given conference year.
5. The design must include the following text that may or may not be incorporated as an integral part of the illustration (type face[s] may be original or traditional in design): Technology Student Association
6. The words “Technology Student Association” are part of the emblem design. Use of the emblem, therefore, can meet the requirement above (5a.) but entries also may include “Technology Student Association” separately.

Judging Criteria:

Graphic Designs will be judged using the following rubric:

35 points - Impact: effective depiction, eye appeal

25 points - Graphic: appropriateness, readable/dimensions/placement of fonts, final product presentation

20 points - Design Elements: balance, dominance, proportion, unity

20 points - Technical Explanation: one page, programs used, inspiration, graphics relates to competition, grammar/spelling, cited work in MLA format.

For further information or a sample judging sheet, refer to the National TSA Conference Competitive Events Guide or contact the Technology Education Instructional Supervisor for Miami-Dade County Public Schools at (305) 693-3030.

Class 609 – Technical Design (Level I)**Class 610 – Technical Design (Level III)**

Challenge: to use the technical design process to solve a given problem statement with specific criteria and constraints.

The design challenge for 2020 is to design a device that will sort a mixture of coins into dimes, nickels, and quarters.

Rules:

1. Only group entries will be accepted. The maximum group size is two (2).
2. An entry tag or copy of the entry tag must be securely attached to each part of the exhibit.

Regulations:

1. All entries should solve the given problem.
2. A display of the solution and proof of the design process will be presented. The display is not to exceed the size of a standard science project board.
3. The display must include the following documentation:
4. Problem statement with a list of criteria and constraints set forth in design brief. (1 page)
5. Evidence of brainstorming (mind mapping, reverse engineering, word association, etc.) used to develop ideas to solve the problem. (1 page)
6. Three hand drawn sketches of different solutions for the stated problem. Each sketch should be based on the brainstorming process. Also, each sketch should include a pro/con list written on the sketch to assist in selecting the best design. Each sketch needs to be presented individually. (3 pages)
7. An engineering drawing of what you consider the best solution based on your pro/con list for each design. (1 page)
8. An evaluation of the final solution based on your engineering drawing that answers the question, “Does the final design meet all the elements set forth in the design brief. (1 page)
9. The device/system is to be mounted on a base not to exceed 18”x 18”. The stand alone presentation should be no larger than a standard science board.

Class 611 – Engineering Design (Level II)**Class 612 – Engineering Design (Level IV)**

Challenge: Through research and critical problem-solving, teams will develop a solution to the TSA grand challenge for 2020: Practical and Cost Effective Uses for Solar Energy in a Home. Through use of a model/prototype, display, and notebook, participants document and justify their approach and reasoning in identifying a problem and their solution’s direct impact on a member of their community and on society.

Participants apply the principles and practices of engineering and universal design in developing an effective and practical solution to a specific design

problem that they have identified, which incorporates the application of scientific and mathematical principles and concepts, which demonstrates the application of technology, and which assesses the impact of the solution on a specific individual and on society.

Rules:

1. Only one entry per student will be permitted. Group entries will be accepted. The maximum group size is five (5).
2. An entry tag or copy of the entry tag must be securely attached to each part of the exhibit.
3. The entire solution (including model/prototype, design portfolio, display and any equipment needed for the presentation) must not exceed 15" deep x 3' wide x 4' high.
4. A documentation notebook is required and must be submitted with the model or prototype. A standard three (3)-ring binder, with a clear front sleeve for a cover page, is required. The inside of the binder must include the following single-sided, 8½" x 11" (computer-generated) pages, in this order:
 - Title page with student name(s) school name and title of project (new device or device improvement)
 - Table of contents
 - Descriptions and illustrations of a minimum of three (3) possible solutions with a brief but concise evaluation of the merits of each
 - A detailed description of the final solution, including an explanation of the steps of operation
5. A three (3)-dimensional technical or CAD drawing and/or rendering of the final solution; the maximum sheet size is drawing sheet cut size B—11" x 17"; when this sheet size is used, the sheet must be hole-punched and folded or placed in a sheet protector for insertion in the binder

Judging Criteria:

Notebook.....	20 Points
Technical Drawing	10 Points
Model /Prototype: effectiveness of design, creativity and innovation, appearance and quality of model construction.....	70 Points

Class Number, Level, and Title:

- Class 601 - Level I - Dragster
- Class 602 - Level II- Dragster Design Challenge
- Class 603 - Level III - Dragster
- Class 604 - Level IV - Dragster Design Challenge
- Class 605 - Level I - Promotional Design Challenge
- Class 606 - Level III - Promotional Design Challenge
- Class 607 - Level II - Promotional Graphics
- Class 608 - Level IV - Promotional Graphics
- Class 609 - (Level I) Technical Design
- Class 610 - (Level III) Technical Design
- Class 611 - (Level II) Engineering Design
- Class 612 - (Level IV) Engineering Design

Premiums and Trophies:

CO2 Car Races:

- Overall First Place Trophy
- Overall Second Place Trophy
- Overall Third Place Trophy
- Outstanding School Trophy

- Purple Ribbon..... \$10.00 and Rosette
- Blue Ribbon 8.00
- Red Ribbon 6.00
- White Ribbon 4.00
- Yellow Ribbon..... Ribbon Only

If there are no entries meeting the quality standards for any special awards, no award will be given.