

2026-2027 Texas Charter School Academic & Athletic League Team Science Competition

I. Rounds & Divisions

TCSAAL Team Science contestants will compete in one (1) state level competition. Consistent with TCSAAL events, entries will be divided into two divisions by grade: i) 6th – 8th grades, and ii) 9th – 12th grades. Divisions will compete exclusively of one-another and individual students can compete amongst older division grades, but cannot compete amongst a younger division, nor can they compete in both divisions.

II. Fees

Entry fees are \$200.00 per team. The TCSAAL Team Science Competition has one (1) entry type: a team of one (1) to four (4) participants registered for three (3) competition events and the *Overall Competition* event. Campuses may enter an unlimited number of teams and are not required to organize teams by size; for example, a campus may register four (4) individual participants as four (4) separate teams.

III. Events & Rules

The TCSAAL Team Science Competition will consist of group events. Participation in all events is necessary for eligible competition for overall placements and awards (see *Awards* below). Order of events will be as follows:

a. Timed Project: Balsa Bridge

- i. For this competition, teams will be expected to build a suspension balsa wood bridge capable of spanning a 18" (eighteen inch) gap while supporting a wooden 2" x 2" x .5" wooden plank that contains an eyehook or s-hook, and hanging from this hook a traditional plastic 5 gallon paint bucket. Teams will all begin this project at the same time and they will be given forty-five (45) minutes to construct their balsa bridge.
 - A. See image of wood plank below for example:

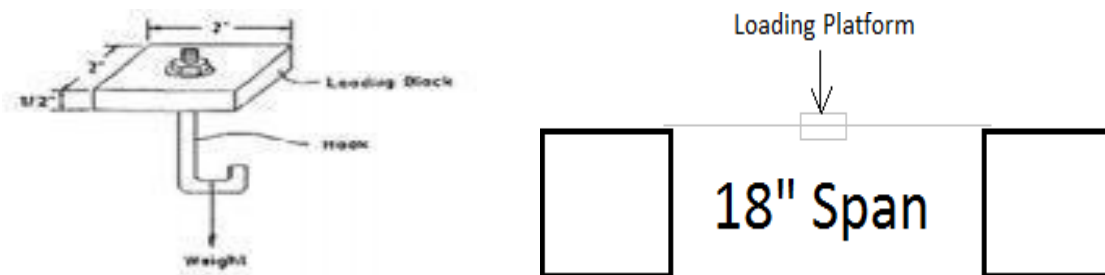


Figure 1

- ii. Teams are permitted to only use liquid super glue adhesives and balsa wood planks no wider than 0.25" (one-quarter of an inch). There will be 15 feet of 0.25"x0.25" balsa wood per team provided, in five equally sized planks that are 0.25"x0.25"x36". 0.33 oz (9g) of super glue will be provided to each team.
- iii. Teams are permitted to provide and use their own cutting and measuring supplies, but cannot use anything beyond the provided materials in the completed bridge. Hot glue guns CANNOT be used.
- iv. Combinations of flush, parallel planks are strictly forbidden see example below:

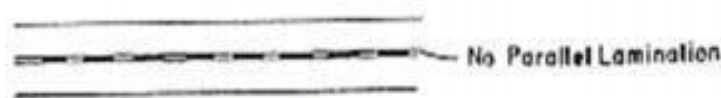


Figure 4

Exceptions:

- A. Flush, parallel planks that are overlapping are permitted a maximum overlap of 0.5" (one-half of an inch).
 - a. See image for example:

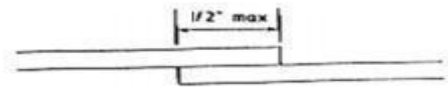


Figure 5

- B. Parallel planks that are separated by 0.25" (one-quarter of an inch) space.
 - a. See image for example:

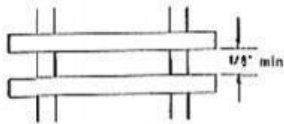


Figure 6

- v. The width of the bridge (the measurement parallel to the bridge's span) cannot exceed 24" (twenty-four inches).
- vi. The depth of the bridge (the measurement horizontally perpendicular to the bridge's span) cannot exceed 6" (six inches).
- vii. The height of the bridge (the measurement vertically perpendicular to the bridge's span) cannot exceed 8" (eight inches).
- viii. The bridge cannot butt their bridge against the support of the surface it is spanning.
 - A. See image for example:

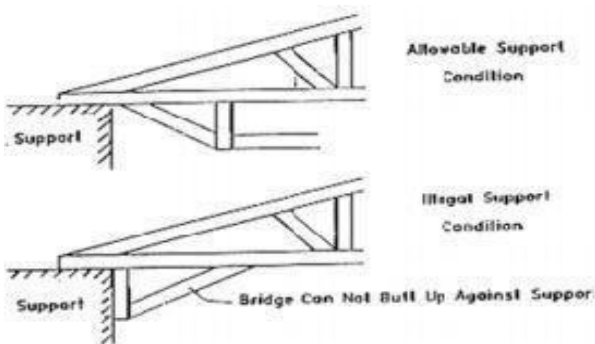


Figure 9

- ix. Bridges will be expected to support additional weights that will be added to the bucket during testing.
 - A. Weights will be provided in the following varieties:
 - a. 10 lbs (ten pounds)
 - b. 5 lbs (five pounds)
 - c. 2.5 lbs (two and a half pounds)
 - i. Plate weights will vary in size, but will be part of a standard weight bench set.
- x. Bridges will also be required to have a span capable of bridging two surfaces that are 1.5' (one-and-a-half feet) or 18" (eighteen inches) apart.
- xi. One (1) team member will be required to position the bridge over the span and add the weight loading block.
- xii. Teams are required to supply one (1) team member to place the weights in the weight bucket for their team's bridge.
- xiii. Eye protection must be worn while loading the bridge. Safety glasses will be provided at the competition.
- xiv. Following weight placement, a stopwatch will count to three (3) seconds. Following three (3) seconds, if the structure of the bridge has not been compromised by the weight placement, the weight placement will be scored as successful. From there, the team will add weight(s) to the weight already placed within the bucket.
- xv. Teams will not be able to remove weights once they have been placed within the bucket. They can only add weights.
- xvi. In the event that the structure supports all allotted weight for testing, the weights will then be removed and the bridge returned to the team.

- xvii. A. Scoring will be based on which bridge holds the most amount of weight.
The top twenty (20) rankings will be given points towards the *Overall Competition*, with the 1st, 2nd, 3rd,...etc. highest ranking being awarded 20, 19, 18,...etc. points, with the twentieth (20th) highest ranking ratio being awarded one (1) point, and all ratios ranked twenty-first (21st) and beneath being awarded zero (0) points.

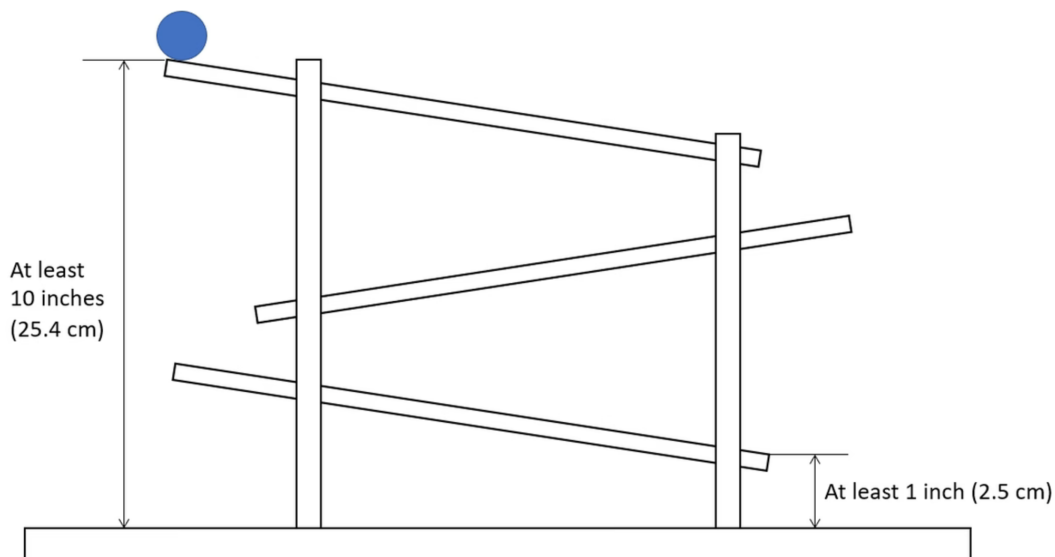
b. Timed Project: Mousetrap Vehicle

- i. Mousetrap Vehicle: Teams are to construct a mousetrap vehicle. The vehicle must power itself by virtue of a mousetrap, and the aim is to achieve the greatest displacement possible along a fixed, straight track. This event will be a traditional mousetrap vehicle competition, in which teams are provided materials and are expected to design and build a vehicle propelled solely by the momentum created by the physical reaction of a mousetrap spring within a maximum time of thirty (30) minutes. Teams will be provided their materials at the beginning of the round.
- ii. The materials themselves will consist of only:
 - A. One (1) build-it-yourself kit, the contents of which can be reviewed or purchased for practice (TCSAAL will provide kits for teams at competition) at the following website:
<https://www.docfizzix.com/products/vehicle-kits/mousetrap-powered/kmtv100df.shtml>
Teams will use the “The Basic Kit” from Doc Fizzix. Teams can use the kit to build the mousetrap vehicle however they choose. Teams are not required to use all of their materials.
 - B. And 9 grams of super glue. Hot glue guns cannot be used.
- iii. At the end of thirty (30) minutes, teams will submit their car for testing.
 - a. The vehicle will be tested along a track.
 - a. Track Specifications:
 - i. The track will be:
 - 6 feet wide
 - 100 feet long
 - Vehicle can start anywhere on the 6-foot line
 - The track will be wiped clean of dirt and debris after each trial and prior to the release of the next trial.
 - b. Participants will be signaled to release the vehicle from anywhere on the starting line by TCSAAL judge(s).
 - c. Participants’ vehicles will then travel until momentum has been exhausted and the car remains at rest.
 - d. At this point the total displacement traveled of the furthest back part of the vehicle (not including the 6” lever arm extending from the mousetrap) from the vehicle release point of the starting line will be measured by TCSAAL judge(s).
 - i. If the vehicle travels outside the width of the track (outside the taped width of the track, judges will use the point that the vehicle exited the track lane as the final length of displacement and the measurement will take place from that point to the starting line. Teams will not be disqualified if the vehicle exits the taped width of the track.
 - e. If the vehicle travels beyond the 100-foot length of the track, the vehicle will receive a max score.
 - f. The vehicle must travel a minimum of 6 feet in order to be counted for a team score. For trials in which the vehicle does not travel at least 6 feet, the trial will be marked as a “SCRATCH.”
 - g. Participants will have two trials, with the furthest distance ranked among their competitors.
 - h. Distance will be measured, with the greatest distance being awarded the highest ranking, the second greatest distance being awarded the second highest ranking, and so forth.
 - i. The top twenty (20) ranking will be given points towards the Overall Competition, with the 1st, 2nd, 3rd, etc. highest ranking being awarded 20, 19, 18, etc. points, with the twentieth (20th) highest ranking ratio being awarded one (1) point, and all ratios ranked twenty-first (21st) and beneath being awarded zero (0) points.

c. Timed Project: Paper Ball Run Challenge

- a. Teams are to build a paper ball run using only construction paper, scissors, and Scotch tape. The run must support a ping-pong ball and allow it to travel from a higher entrance point to a lower exit point. The objective is to construct a run in which the ping-pong ball takes the longest amount of time to travel from the entrance point to the exit point.
- b. For this project, teams are given thirty (30) sheets of construction paper (9” x 12”), scissors, and one (1) roll of scotch tape. Teams will only be allowed to use the materials provided to them to construct their paper ball run. This includes only construction paper, scissors, and scotch tape. Roll of scotch tape will measure ¾” x 1000.” Construction paper will be 9” x 12” in dimension. Teams are only permitted to use scissors provided by TCSAAL. Each team will be given two (2) pairs of scissors. Personal scissors, cutting tools, measuring devices, and other tools are not permitted.
- c. Construction paper may be cut, folded, rolled, creased, or torn as part of the construction. No material may be added to the construction paper or tape.
- d. Teams will be given thirty (30) minutes to complete the ball run.

- e. The tabletop is the only permitted supporting surface. A structure that extends from the table to the floor or that is supported by the floor is not permitted. No portion of the run may extend below the height of the tabletop before the ball reaches the exit point.
- f. The run must have both an entrance point and an exit point for the ball.
 - i. The entrance point is where the ball is placed into the run. It must be at least 10 inches above the supporting surface.
 - ii. The exit point is where the ball exits the run. It must be at least 1 inch above the surface.



- g. Each team will be assigned a marked construction area measuring 24 inches by 24 inches on the tabletop. The entire ball run must remain within the vertical boundaries extending upward from the marked construction area. The structure may not exceed 36 inches in height, measured from the tabletop. No portion of the structure may extend beyond the edge of the table, below the tabletop, or outside the marked construction area. The structure may not touch the floor, wall, furniture, another team's structure, or any object outside the marked construction area.
- h. The ball cannot be modified in any way or have anything attached to it.
- i. The ball must be gently placed into the run to start. It cannot be dropped from above the run, thrown, flicked, etc.
- j. Teams will be given one (1) ping pong ball for practice purposes during the allotted time.
- k. Time starts when the ball is placed in the run and ends when the ball exits the run. Time will be kept by the judge using a traditional stopwatch. Time will be stopped when the ball EXITS THE RUN, NOT WHEN THE BALL COMES IN CONTACT WITH THE HORIZONTAL SURFACE (i.e. table).
- l. After the ball has entered the run, you cannot touch the ball or the run, or influence their motion in any way (e.g., by blowing on the ball, shaking the table, or tilting the run, etc.).
- m. Teams will be tested on one (1) trial only.
 - i. If the ball becomes stuck during the team's initial trial, the team will be permitted one restart. No repairs, adjustments, or modifications may be made before the restart.
 - ii. A ball is considered stuck when it remains motionless for five consecutive seconds before reaching the exit point. The judge will stop the trial and declare the ball stuck at this point.
 - iii. If the ball becomes stuck during the restart, the team will receive no recorded time for that trial.
 - iv. The ball may move slowly or pause temporarily, but it must continue progressing through the run without outside assistance. A ball that remains completely motionless for five consecutive seconds will be considered stuck.
 - v. The restart will only take place if the ball gets stuck and does not move for more than 5 seconds.
- n. The number of paper sheets used for the run DO NOT impact (for / against) the team score. The team score is based solely on the time of your run.
- o. Ball runs will be timed by the judge and will then be ranked from longest run to the shortest run.
- p. The top ten (10) rankings will be given points towards the Overall Competition, with the 1st, 2nd, 3rd, etc. highest ranking being awarded 10, 9, 8, etc. points, with the tenth (10th) highest ranking ratio being awarded one (1) point, and all ratios ranked eleventh (11th) and beneath being awarded zero (0) points.

IV. Accessibility

TCSAAL is committed to providing reasonable accommodations for students with disabilities. Directors should notify TCSAAL of any accessibility needs at least 1 week prior to the competition.

V. Rankings & Awards

- a. Team scores will be totaled and the top three will be ranked, with 1st place receiving the most aggregate points amongst events, 2nd place receiving the second most aggregate points amongst events, and 3rd place receiving the third most aggregate point total amongst events. There will be team trophies awarded to the teams that come in 1st, 2nd and 3rd place (in each age group). The participants of the 3 ranking teams will also receive individual medals.
 - i. In the event that we have a tie, the tie will be broken first by virtue of head-to-head comparison of Balsa Bridge ranking. If rankings are still tied, teams will then be ranked by virtue of the Mousetrap Vehicle results. If rankings are still tied, teams will then be ranked by virtue of the Paper Ball Run results.