2012-13 Texas Charter School Academic & Athletic League

Science Olympiad

I. Dates & Location

The 2012-13 TCSAAL Science Olympiad will take place on December 8, 2012 in Austin, Texas. The competition will begin at 10:00 am. Although we cannot have an accurate time of conclusion teams should plan to be there at least until 5:00 pm.

II. Rounds & Divisions

For this year of the Science Olympiad Competition, there will not be a regional qualifying round. All entries will compete in one (1) state level competition. Consistent with TCSAAL events, entries will be divided into two divisions by grade: i) 6^{th} – 8^{th} grades, and ii) 9^{th} – 12^{th} 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.

III. Fees

Entry fees for the 2012-13 TCSAAL Science Olympiad will be set at $150.00 per team. There is only one (1) type of entry for the TCSAAL Science Olympiad, which registers a team of one (1) to four (4) participants in three (3) competition events, as well as an *Overall Competition* event. Campuses are unlimited in the number of team entries allowed, and are not required to organize their teams in any quantitative fashion [i.e. campuses are permitted to register four (4) individual participants as four (4) different teams, should they choose to do so].

IV. Events & Rules

The third annual TCSAAL Science Olympiad will consist of group events. Participation in all events is necessary for eligible competition for overall placements and awards (see *Awards* below).

A. Timed Project: Mousetrap Vehicles: One car will compete for distance and one car will race for fastest time over a 15 foot distance.

The starting event of the TCSAAL Science Olympiad will be a traditional mousetrap vehicle competition, in which teams are provided materials and are expected to design and build two vehicles propelled solely by the momentum created by the physical reaction of a mousetrap spring within a maximum time

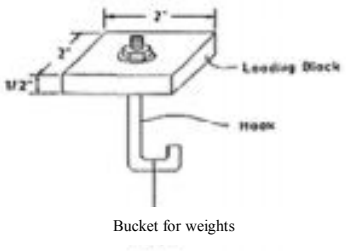
of 1.5 hours. The first of these vehicles will be built for the purpose of achieving the fastest time over a 15 foot distance, and the second of these vehicles will be built for the purposes of achieving maximum distance traveled.

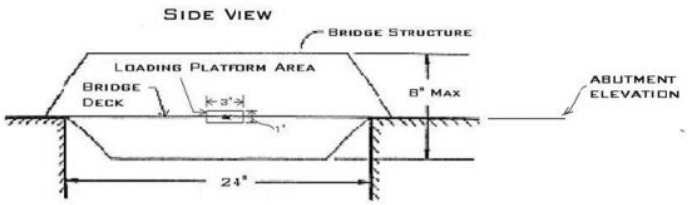
i. Teams will be provided their materials at the beginning of the round.
ii. The materials themselves will consist of only two (2) build-it-yourself kits, the contents of which can be reviewed or purchased for practice (TCSAAL will provide kits for teams at competition) at the following website: http://www.docfizzix.com/products/parts-supplies/supp700df.shtml, We will be using the kits "Build your own mousetrap car kit" from Doc Fizzix. Teams can use both kits to build their two (2) cars however they choose. Materials of both kits can be used on either car. Teams are not limited to using one kit per car. For example, each kit comes with four (4) wheels totaling eight (8) wheels. These wheels can be distributed between the 2 cars however the teams decide. Teams are not required to use all of their materials. Please note teams are required to build two (2) cars.
iii. At the end of ninety (90) minutes, vehicles will be tested and ranked.
    A. The first of these vehicles will be tested along a 15 foot track which spans a width to be determined as location is secured. The purpose is to see which car travels the fastest over a 15 foot distance.
        a. Upon any part of the vehicle crossing the starting line, a stopwatch is started and vehicles will be timed until the point that all parts of the vehicle completely cross the finish line.
        b. Participants will have two trials, with the fastest time ranked among their competitors.
        c. Cars that do not cross the finish line will not receive a time. And teams failing to cross the finish line in one of their 2 trials will not receive a score for this event.
        d. The top ten (10) ranking will be given points towards, *Overall Competition*, with the 1^{st}, 2^{nd}, 3^{rd},…etc. highest ranking being awarded 10, 9, 8,…etc. points, with the tenth (10^{th}) fastest vehicle being awarded one (1) point, and all velocities ranked eleventh (11^{th}) and beneath being awarded zero (0) points.
    B. The second of these vehicles will be tested along a room-length track, the dimensions of which are to be determined as location is secured.

a. Participants will be signaled to release the vehicle from the center-point of the starting line.
b. Participants' vehicles will then travel until momentum has been exhausted and the car remains at rest.
c. At this point, the total distance traveled of the furthest back part of the vehicle from the center-point of the starting line will be measured.
d. Participants will have two trials, with the furthest distance ranked among their competitors.
e. The top ten (10) ranking will be given points towards, *Overall Competition*, with the 1st, 2nd, 3rd,…etc. highest ranking being awarded 10, 9, 8,…etc. points, with the tenth (10th) furthest displaced vehicle being awarded one (1) point, and all displacements ranked eleventh (11th) and beneath being awarded zero (0) points.

B. Timed Project: Suspension Balsa Bridge

i. For this competition, teams will be expected to build a suspension balsa wood bridge capable of spanning a 24" (twenty-four 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 90 minutes (1.5 hours) to construct their balsa bridge.
   A. See image of wood plank below for example:

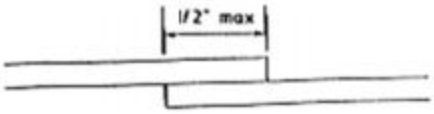




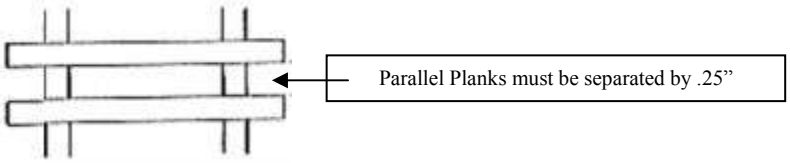
ii. Teams are permitted to only use liquid super glue adhesives and balsa wood planks no wider than .25" (one-quarter of an inch) There will be 15 feet of .25"x.25" balsa wood per team provided, in five equally sized planks that are .25"x.25"x36". 0.33 oz (9g) of super glue will be provided to each team.
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.
iv. Combinations of flush, parallel planks are strictly forbidden see example below:

with the following exceptions:

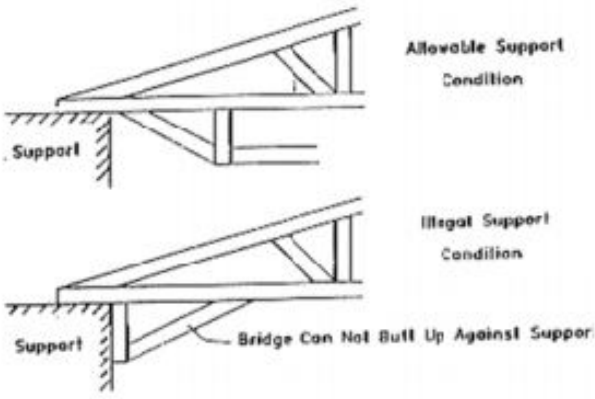
A. Flush, parallel planks that are overlapping are permitted a maximum overlap of .5" (one-half of an inch)
    a. See image for example:



B. Parallel planks that are separated by .25" (one-quarter of an inch) space.
    a. See image for example:



v. The width of the bridge (the measurement parallel to the bridge's span) cannot exceed 30" (thirty 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 against the support of the surface it is spanning.
    A. See image for example:



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 2' (two feet) or 24" (twenty-four 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 his/her 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.
xv. The total amount of successful weight placed within the bucket before the bucket is no longer supported by the strength of the bridge.
    A. As opposed to previous competitions, teams will not be able to remove weights once they have been placed within the bucket.
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.
    A. Scoring will be based on which bridge holds the most amount of weight.
xvii. 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 eleventh (21st) and beneath being awarded zero (0) points.

C. Timed Project: Straw Tower

This project will be a straw tower building competition, in which teams are provided materials and are expected to design and build a structure with the aim of achieving the maximum height allotted by the materials provided within a fifteen (15) minute time limit while being able to hold a designated load for five (5) seconds.

i. Teams will be provided their materials at the beginning of the round.
ii. The materials themselves will consist of only fifty (50) flexible drinking straws, one (1) roll of scotch tape (3/4" X 1000"), a pair

of scissors and one (1) standard tennis ball. No other materials will be allowed to be used.

iii. The tower must be constructed using only the flexible drinking straws and scotch tape and be able to hold the tennis ball. The scissors cannot be a part of the structure, but can be used in the process.

iv. The straws can be interconnected by sliding one end into the other. Straws may be bent, cut, or slit.

v. All structures must be able to balance and hold the weight of the tennis ball as the load for five (5) seconds. Any structure that is unable to hold the designated load will be disqualified.

vi. At the end of fifteen (15) minutes, structures will be tested for qualifying load-capacity, measured for heights, and ranked. Measurements will be taken from the base of the structure to the lowest point of the tennis ball. All structures must be free-standing without aid from other objects.

vii. The top ten (10) ranking teams will be given points towards, *Overall Competition*, with the 1st, 2nd, 3rd,…etc. highest ranking being awarded 10, 9, 8,…etc. points, with the tenth (10th) tallest structure being awarded one (1) point, and all heights ranked eleventh (11th) and beneath being awarded zero (0) points.

V. Rankings & Awards

Teams' 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.

In the event that we have a tie there will be a final impromptu activity that the tied teams will participate in to determine ranking.