



TECHNOLOGY PROBLEM SOLVING

OVERVIEW

Participants use their skills in problem solving to develop a finite solution to the stated problem provided on site. Participants work as a team to provide the best solution, which is measured objectively.

ELIGIBILITY

Participants are limited to one (1) team of two (2) members per chapter.

TIME LIMITS

- A. The allotted time for design and construction of the solution is two (2) hours.
- B. Semifinalists will participate in a LEAP interview that will last a maximum of five (5) minutes.

LEAP LEADERSHIP RESUME/INTERVIEW

A Team LEAP Leadership Resume is required for this event and must be submitted at event check-in. Semifinalists will respond to interview questions related to their submitted LEAP Resume for a maximum of five (5) minutes.

ATTIRE

Competition attire, as described in the [National TSA Dress Code](#) section of this guide, is required for this event.

PROCEDURE

- A. Participants report to the event area and submit a LEAP Leadership Resume at the time and place stated in the conference program.
- B. The problem, evaluation criteria, and materials are distributed.
- C. Participants are required to provide their own tool box (with identification [school name, address, and advisor cell phone number]), which should not exceed twenty (20) inches (508

For this event, participants are required to provide their own tool box, with TSA-suggested supplies.



Read the General Rules and Regulations section in the front of this guide for information that applies to all of TSA's competitive events.

mm) length x ten (10) inches (254 mm) width x ten (10) inches (254 mm) height. The box must contain all items needed to fabricate the solution/entry. The following is a suggested list:

1. Cutting devices; NONE may be electric
 2. Adhesives
 - a. aerosol and electric applicators are not allowed
 - b. a bottle of Uncure or Debonder is recommended
 3. Temporary fastening devices
 - a. straight pins
 - b. clamps
 - c. tape
 4. A cutting surface that prevents table top marring (required)
 5. Rulers, straightedges, and/or measuring scales
 6. Abrasives sheets, sponges, boards
 7. Marking devices (pens, pencils, etc.) and sharpener
 8. Sheet of wax paper, as large as is needed for the competition
 9. Pliers, wrenches, nut drivers, as needed
 10. Safety glasses and side shields (required)
- D. **Participants are required to provide and wear safety-approved eyewear for this event.** Prescription eyewear will need to have side shields to be considered safety eyewear. Should a team member remove his/her eyewear, s/he will be reminded once to replace it. If there is a second infraction, the team will be asked to leave the competition. Sunglasses are not suitable eyewear.
- E. Each student also is required to bring the following items:
1. one (1) roll $\frac{3}{4}$ " masking tape
 2. twelve (12) 3" x 5" index cards
 3. twelve (12) Popsicle sticks or tongue depressors
 4. six (6) 8½" x 11" sheets of printer paper (20-pound bond)
 5. fifteen (15) sheets of 8½" x 11" cardstock (65-pound weight)
 6. six (6) drinking straws
 7. six (6) styrofoam trays; trays should be no larger than 7" x 10"
- F. Teams have two (2) hours to design and construct a solution.
- G. Each solution is tested as soon as possible after the construction phase is completed. (Some problems may require teams to be present for testing.)
- H. Semifinalists will be determined and posted by the CRC.
- I. Semifinalist teams will report at the time and place stated in the conference program to sign up for a semifinalist LEAP interview.
- J. The LEAP interview will last a maximum of five (5) minutes.
- K. Ten (10) finalists are announced at the awards ceremony.



It is essential that students and advisors routinely check the TSA website (www.tsaweb.org) for updated information about TSA general rules and competitive events. This information is found on the website under [Competitions/Updates](#). When students participate in any TSA competitive event, they are responsible for knowing of updates, changes, or clarification related to that event.

REGULATIONS

- A. All work must be completed in the event area during the time specified for the event.
- B. Specific materials related to the on-site problem will be provided by TSA. Only the materials issued to each team by the event coordinator, or the items that students are required to bring, may be used in the development of the solution.
- C. Only the toolbox items in Procedure C, the materials in Procedure E, and any items supplied by the coordinator may be used in the development of the solution. Participants without a toolbox will not be allowed to compete. Sharing tools between teams is not permitted.
- D. LEAP Leadership Resume (see Forms Appendix or TSA website)/Interview — Teams document, in the LEAP leadership resume (see resume template), the leadership skills that the team has developed and demonstrated while working on this event. Semifinalists will respond to questions about the content of their resume as part of their presentation and/or interview. The LEAP Leadership Resume/Interview guidelines and other resources can be found on the [TSA website](#).

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 do the evaluators use subjective criteria, such as originality, to evaluate solutions. The LEAP requirements will also be evaluated. Please refer to the official rating form for more information.



STEM INTEGRATION

This event aligns with the STEM educational standards noted below. Please refer to the STEM Integration section of this guide for more information.

Science, Technology, Engineering, Mathematics

TSA AND CAREERS

This competition connects to one or more of the career areas featured in the TSA AND CAREERS section of this guide. Use *The Career Clusters* chart and the *TSA Competitions and The Career Clusters* grid as resources for information about careers.

CAREERS RELATED TO THIS EVENT

Computer software engineer
Mathematician
Criminal investigator
Air traffic controller

TECHNOLOGY PROBLEM SOLVING EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Assistants for set-up, monitoring, and clean-up of on-site activity, two (2) or more per 100 teams
 - 1. Depending on the problem, one of the assistants may need to serve as timekeeper.
 - 2. Not all assistants are needed for set-up and clean-up, but all are needed while the on-site activity is being held.
- C. Evaluators, two (2) or more
- D. Evaluators for semifinalist interviews, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each evaluator
 - 2. TSA Event Coordinator Report
 - 3. List of evaluators/assistants
 - 4. Pre-populated flash drives for evaluators
 - 5. ID tags or stick-on labels to identify entries
 - 6. Stopwatch
 - 7. Results envelope
 - 8. Envelope for LEAP Leadership Resumes
 - 9. LEAP Interview Judging Protocol
- B. Tables and chairs for participants
- C. Tables and chairs for evaluators, to be used for tools/materials distribution and evaluation
- D. Well-written, technologically appropriate problem that can be objectively measured; one (1) copy per team and evaluator
- E. Adequate conditions, tools, materials, monitoring, and testing devices for the problem

RESPONSIBILITIES

- A. Upon arrival at the conference, report to the CRC room and check the contents of the coordinator's packet. Review the



- event guidelines, and check to see that enough evaluators/assistants have been scheduled.
- B. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
 - C. One (1) hour before the event is scheduled to begin, meet with evaluators/assistants to review time limits, procedures, and regulations. If questions arise that cannot be answered, speak to the event manager before the event begins.
 - D. For participants who violate the rules, the decision either to deduct 20% of the total possible points or to disqualify the entry must be discussed and verified with the evaluators, event coordinator, and a CRC manager.
 - E. Distribute materials as appropriate, prior to the event
 - F. Begin the event at the scheduled time by closing the doors and checking the coordinator's report. Collect LEAP Leadership Resumes from each team. All participants and evaluators should be in the room at this time. In order to compete, participants must be on the entry list or must have approval of the CRC.
 - G. Each team will display its tools using the tool template (paper template) provided, as necessary. Only tools displayed will be permitted.
 - H. Toolboxes must be removed from a team's work table prior to when participants begin the design and construction of the solution.
 - I. Once teams are seated (checked against the coordinator's report), LEAP Leadership Resumes are collected, and general announcements have been made, the event problem will be distributed, reviewed, and time will be started.
 - J. Evaluators and monitors observe the entire construction phase, with evaluators measuring solutions as soon as appropriate.
 - K. Evaluators will collect the solution design when the team's solution is submitted for testing. Evaluators will use the designs to break any ties in order to determine the twelve (12) semifinalist teams.
 - L. Semifinalists will be determined and posted by the CRC.
 - M. Semifinalist teams will report at the time and place stated in the conference program to sign up for a semifinalist LEAP interview.
 - N. The LEAP interview will last a maximum of five (5) minutes.



- O. Review and submit the finalist results and all items/forms in the results envelope to the CRC room.
- P. If necessary, manage security and the removal of materials from the area.



Participant/Team ID# _____

TECHNOLOGY PROBLEM SOLVING

2017 & 2018 OFFICIAL RATING FORM

HIGH SCHOOL

Before judging the entry, ensure that the items below are present; indicate presence with a check mark in the box. If an item is missing, leave the box blank and place a check mark in the box labeled ENTRY NOT EVALUATED. If a check mark is placed in the ENTRY NOT EVALUATED box, the entry is not to be judged.

- Students have safety eyewear.
- The toolkit is present.
- Additional required items are present.
- Completed LEAP Leadership Resume is present.
- ENTRY NOT EVALUATED

Solution Development (20 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
Evaluators: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline, record the scores earned for the event criteria in the column spaces to the right. The X1 or X2 notation in the criteria column is a multiplier factor for determining the points earned. (Example: an "adequate" score of 7 for an X1 criterion = 7 points; an "adequate" score of 7 for an X2 criterion = 14 points.) A score of zero (0) is acceptable if the minimal performance for any criterion is not met.			
Solution to problem (X2)	The solution developed is unable to fully meet or solve the defined problem.	The solution developed is somewhat able to address the problem.	The solution developed fully and clearly meets or solves the identified problem.
			SUBTOTAL (20 points)

Rules violations (a deduction of 20% of the total possible points in the section above) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

Testing of Solutions (50 points)

Evaluation

A finite unit of measure, such as elapsed time, linear distance, and/or strength, etc., is used to determine ranking.

1st - 50 points	2nd - 45 points	3rd - 40 points	4th - 35 points	5th - 30 points
6th - 25 points	7th - 20 points	8th - 15 points	9th - 10 points	10th - 5 points
				SUBTOTAL (50 points)

Record scores in the column spaces below.



Semifinalist LEAP Interview (20 points)			
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
LEAP Leadership Resume/Interview See Regulation D and instructions on TSA website (X2)	The team's efforts are not clearly communicated, lack detail, and/or are unconvincing; few, if any, attempts are made to identify and/or incorporate the LEAP Be. Know. Do. criteria.	The team's efforts are adequately communicated, include some detail, are clear, and/or are generally convincing; identification and/or incorporation of the LEAP Be. Know. Do. criteria is adequate.	The team's efforts are clearly communicated, fully-detailed, and convincing; identification and/or incorporation of the LEAP Be. Know. Do. criteria is excellent.
			SUBTOTAL (20 points)

Rules violations (a deduction of 20% of the total possible points in the semifinalist section) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

(To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.) **TOTAL (90 points)**

Comments:

I certify these results to be true and accurate to the best of my knowledge.

Evaluator

Printed name: _____ Signature: _____