

OVERVIEW

Applying leadership and 21st century skills, participants respond to an annual coding-related design challenge by developing a software program that will accurately address an onsite problem in a specified, limited amount of time. Specific elements to be used, such as the programming language, operating system, or application programming interface (API), will be released onsite. Every effort will be made to support a wide variety of programming languages, and the specific languages, which will be posted on the [TSA website](#) under *Themes & Problems*. Completed solutions are objectively measured to determine the best and most effective solution for the stated problem.

ELIGIBILITY

One (1) team of two (2) individuals per state may participate.

TIME LIMITS

PRELIMINARY ROUND

- A. The one (1)-hour test is administered to all members of the team at the same time.

SEMIFINAL ROUND

- A. Up to two (2) hours is allowed for the design and construction of the solution.
- B. Performance Time: Due to space limitations, judging may occur in rounds.

ATTIRE

TSA competition attire is required for this event.

PROCEDURE

PRELIMINARY ROUND

- A. Participants report to the event area at the time and place stated in the conference program for the test.
- B. Participants follow the specific regulations and adhere to the directions provided on-site by the event coordinator.
- C. Both team members must report to the testing area at the same time but will take the exam individually.

- D. The twenty-four (24) top-scoring teams qualify as semifinalists.
- E. A semifinalist list (in random order) is posted.

SEMIFINAL ROUND

- A. Participants bring their own computer systems to the event area at the time and place stated in the conference program.
- B. Participants are given a problem, evaluation criteria, materials, and allotted two (2) hours for the design and construction of the solution.
- C. Each solution is tested and presented to the judges as soon as possible after the coding phase is completed.
- D. The top ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st century skills in the process of preparing for and participating in this TSA competitive event. The development and application of those skills must be evident in their submission, demonstration, and/or communication pertaining to the entry.

PRELIMINARY ROUND

- A. Test may be administered online or via a scan-type answer sheet. Please review the *Competition Updates* page on the [TSA website](#).
- B. Scan-type forms are furnished by the event coordinator, if applicable.
- C. Participants are responsible for bringing two (2) sharpened No.2 pencils to the test site.
- D. Participant identification numbers must be entered on the scan form in the space indicated.
- E. Failure to follow instructions will result in the score sheet not being scored.
- F. Participants must stop work immediately when time is called.

- G. Should a participant complete the test before the time allocated is over, the participant will submit the test and scantron form to the coordinator without any form of communication with any other member. Failure to do so results in disqualification of the participation.
- H. All tests must be turned in before leaving the test area.
- I. The average of the scores of all two (2) team members determines team ranking.

SEMIFINAL ROUND

- A. The specific languages permitted in the on-site competition are posted each year on the [TSA website](#) under *Themes & Problems*.
- B. All work must be completed in the event area during the time specified for the event.
- C. Each team must bring:
 1. one (1) laptop or other device (ex: Microsoft Surface Pro), capable of networking via Wi-Fi, and running solely on battery power for up to two (2) consecutive hours
 2. Pencils, paper, and an external computer mouse are recommended but not required for each team,
- D. External keyboard and monitors are not permitted.
- E. Printed reference materials are not allowed.
- F. Participants do NOT have access to the Internet during the event.
- G. Participants do NOT have access to electrical power/ outlets during the event.
- H. Participants must have all software development tools needed for the competition downloaded and accessible on their laptop or other device.
- I. Participants may only use the permissible programming language's standard library during the on-site competition. No third-party libraries may be used.
- J. Participants are presented with a series of coding problems that must be completed on-site at the conference.

- K. All solutions must be tested, demonstrated, and presented by participants in front of the judges exclusively through electronic submission and evaluation.

EVALUATION

- A. The successful completion of the problems and the time in which it takes individuals or teams to complete all the challenges.
 1. In the event of two or more teams receiving the same amount of points, the team who scored the points fastest will have the higher placement.

Refer to the official rating form for more information.

RESOURCES

The USA Computing Olympiad website and the ACM-ICPC International website are helpful resources for the Coding event. Additional resources that can be used to prepare for the event are listed below:

icpc.baylor.edu/compete/preparation

www.codechef.com

www.usaco.org/index.php?page=contests

blog.hackerearth.com/2013/09/competitive-programming-getting-started_11.html

www.quora.com/What-is-the-best-strategy-to-improve-skills-in-competitive-programming-in-2-3-months

STEM INTEGRATION

Depending upon the subject of the problem, this event may align with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

LEADERSHIP AND 21ST CENTURY SKILL DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st century skills including but not limited to:

- Communication
- Collaboration/Social Skills
- Initiative
- Problem Solving/Risk Taking
- Critical Thinking
- Perseverance/Grit
- Creativity
- Relationship Building/Teamwork
- Dependability/Integrity
- Flexibility/Adaptability

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Computer software engineer
- Mathematician

CODING

2023 & 2024 OFFICIAL RATING FORM

HIGH SCHOOL

Judges: Using minimal (1-4 points), adequate (5-8 points), or exemplary (9-10 points) performance levels as a guideline in the rating form, 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.

Go/No Go Specifications

- 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 next to the item 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.

- Computer hardware is present (semifinals only)
- ENTRY NOT EVALUATED

| | |
|---|--|
| TEST SCORE (50 points) | |
| Average of the two (2) team member’s test scores. | TEST SCORE SUBTOTAL (50 points) |

| | | | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|
| TESTING OF SOLUTION (80 points) | | | | | | | |
| Evaluation: A finite unit of measure, such as elapsed time, linear distance, and/or strength, etc., is used to determine ranking. | | | | | | | |
| 1st: 80 Points | 2nd: 75 Points | 3rd: 70 Points | 4th: 65 Points | 5th: 60 Points | 6th: 55 Points | 7th: 50 Points | 8th: 45 Points |
| 9th: 40 Points | 10th: 35 Points | 11th: 30 Points | 12th: 25 Points | 13th: 20 Points | 14th: 15 Points | 15th: 10 Points | 16th: 5 Points |
| TESTING OF SOLUTION SUBTOTAL (80 points) | | | | | | | |

| |
|--|
| Rules violations (a deduction of 20% of the total possible points for the above sections) must be initialed by the judge, coordinator, and manager of the event. Record the deduction in the space to the right. |
| Indicate the rule violated: _____ |

| |
|--------------------------------------|
| SOLUTION SUBTOTAL (80 points) |
|--------------------------------------|

| | |
|--|---------------------------|
| To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. | TOTAL (130 points) |
|--|---------------------------|



Comments:

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

JUDGE

Printed name: _____ Signature: _____



CODING

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Judges, two (2) or more
- C. Assistants for set-up, monitoring, and clean-up of on-site activity, two (2) or more
- D. Timer for exam, one (1)
- E. Proctors for exam, three (3)

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Results envelope with coordinator forms
 - 5. Copies of the test (coded A or B), one (1) for each participant (these tests must be returned immediately following the event)
- B. Projector
- C. White board or wall for projecting the images
- D. Tables and chairs for participants
- E. Tables and chairs for judges, to be used for information distribution and evaluation
- F. A copy of a well-written, technologically appropriate problem for each participant/team that can be objectively measured
- G. Adequate conditions, tools, materials, monitoring, and testing devices for the problem
 - 1. Stopwatch for timekeeper
 - 2. Tables and chairs or tablet armchairs to accommodate all participants
 - 3. Scantron instruction forms
- H. Coordinators are responsible for creating the test to be administered at the National TSA Conference; copies are provided by the national TSA office.

RESPONSIBILITIES

PRELIMINARY ROUND

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. All participants and event judges should be in the room at this time.
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Distribute the scantron forms to the participants, if applicable.
 - 1. Direct participants to fill in their participant identification number and test code letter in the appropriate spaces.
 - 2. Provide an opportunity for any questions about the scan form.
- F. Ensure the following testing procedure is applied with the help of the proctors (test are coded A or B).
 - 1. Participants seated next to each other should not have the same coded tests; test should be alternated A, B, A, B, and so on.
 - 2. If the test is administered as hard copies, instruct the participants to keep the tests face down until they are directed to turn them over and begin.
 - 3. If exams are administered electronically, instruct participants not to begin until the scheduled time.
- G. Acting as the timer and with proctors positioned around the event room, direct the participants to turn their test over, place their code number and the code letter found on the test on the scan form, and begin.
- H. Exactly one (1) hour from the time that the participants begin the test, call time.
 - 1. Direct students to check out with a test proctor once they are finished with their test.
 - 2. Proctors should collect all tests and then students should immediately leave the testing room.

3. If a line forms, students must remain completely silent. Any talking will result in a zero score for test of the person(s) talking.
- I. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and manager to determine either:
 1. To deduct twenty percent (20%) of the total possible points in this round or
 2. To disqualify the entry
 The event coordinator, judges, and manager must initial either of these actions on the rating form.
- J. Determine the twenty (20) semifinalist teams based on team member's averaged score on the test.
- K. Prepare a list of the twenty (20) semifinalist teams and submit it to the CRC for posting.

AT THE CONFERENCE

- A. Attend the mandatory coordinator's meeting at the designated time and location.
- B. Report to the CRC room and check the contents of the coordinator's packet.
- C. Review the event guidelines and check to see that enough personnel have been scheduled.
- D. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- E. At least one (1) hour before the event is to begin, meet with judges to review time limits, procedures, regulations, evaluation, and all other details pertaining to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.
- D. In order to compete, participants must be on the entry list or must have approval of the CRC.
- E. Check in the semifinalist teams and equipment. Participants must bring:
 1. One (1) laptop
 2. Extra charged laptop battery or extra charged laptop as backup (but only one laptop may be used at any time)
 3. One (1) computer mouse
 4. Teams may also bring pencils and paper.
- F. Teams do NOT have access to electrical power/ outlets during the event.
- G. Teams do NOT have access to the Internet during the event.
- H. Students must have all software development tools needed for the competition downloaded and accessible on their computers.
- I. Once teams are seated and general announcements have been given, distribute and review the problem and start the time.
- J. All solutions must be tested, demonstrated and presented by participants in front of the judges. Judges and assistants observe, with judges evaluating solutions as soon as appropriate.
- K. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and CRC manager to determine either:
 1. To deduct twenty percent (20%) of the total possible points in this round or
 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- L. Judges determine the ten (10) finalists and discuss and break any ties.
- M. Submit the finalist results and all related forms in the results envelope to the CRC room.
- N. If necessary, manage security and the removal of materials from the area.

ON-SITE CODING CHALLENGE

- A. Begin the event at the scheduled time by closing the doors and checking the entry list.
- B. All participants and judges should be in the room at this time.
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond participant control.