



TECHNICAL SKETCHING AND APPLICATION

OVERVIEW

Participants complete a written test in order to qualify as semifinalists. Semifinalists then demonstrate their ability to solve on-site engineering graphics problems using standard drafting techniques.

PURPOSE

Participants have the opportunity to analyze and interpret engineering graphic specifications, use accurate drafting terminology, and use standard sketching, drafting, and problem solving techniques to solve engineering graphic problems.

ELIGIBILITY

Participants are limited to two (2) individuals per chapter.

TIME LIMITS


- A. Participants are allowed sixty (60) minutes to complete the written test.
- B. Semifinalists are allowed ninety (90) minutes to solve the on-site problems using appropriate sketching and practices.

ATTIRE

Competition attire, as described in National TSA Dress Code (www.tsaweb.org/Dress-Code), is required for this event.

PROCEDURE

- A. Participants report to the event area at the time and place stated in the conference program for the written test.
- B. Students take the written test.
- C. The written test is evaluated. A list of semifinalists in random order is posted.
- D. Semifinalists report to the event area at the time stated in the conference program for the on-site activity.

 Participants must provide—and bring to the test site—two (2) pencils (sharpened standard #2/HB grade with an eraser, or #2 mechanical with an eraser) for any competition that involves a written test.


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 and Clarification](#). When students participate in any TSA competitive event, they are responsible for knowing of updates, changes, or clarification related to that event.

REGULATIONS

- A. Scannable answer forms for the written test are furnished at the test site.
- B. Each semifinalist must provide a minimum of two (2) and a maximum of four (4) mechanical pencils (various leads, as desired) and one (1) additional eraser (as desired.)
- C. Semifinalists are provided a drawing surface (e.g., manila folder, clipboard) and two (2) pieces of graph paper.
- D. Semifinalists may not bring any notes or reference materials into the testing/drawing room.
- E. No additional drawing instruments will be allowed in the semifinalist room. Materials provided to semifinalists (including the testing materials, on-site problem paper or item, solution paper or the drawing surface) may not be used to create a straight edge or other drafting edge.

EVALUATION

- A. Semifinalists are those participants with the top twelve (12) scores on the written test.
- B. The semifinalists' solutions to the on-site problems are scored and added to the written test score to determine the rankings of the ten (10) finalists.

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

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

COMMON CORE STATE STANDARDS (CCSS) INTEGRATION

Please refer to the Common Core State Standards (CCSS) Integration section of this guide for more information.

PRIMARY LEADERSHIP SKILLS

Leadership skills promoted in this event:

- COMMUNICATION — Students will use drafting techniques as a language. Suggested leadership lessons: *Promote It* and *Put It Together*
- CRITICAL THINKING — Student will analyze and interpret a design. Suggested leadership lessons: *And The Answer Is* and *Figure It Out*
- PROBLEM SOLVING — Student will analyze a problem and create a solution for it. Suggested leadership lessons: *Effective Brainstorming* and *Problem Solving Steps*

Additional leadership skills promoted in this event: decision making, evaluation

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 16 Career Clusters* chart and the *TSA Competitions and The 16 Career Clusters* grid as resources for information about careers.

CAREERS RELATED TO THIS EVENT

Architect
Mechanical engineer
Product designer
Quality control engineer
Structural engineer

TECHNICAL SKETCHING AND APPLICATION

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Assistants for written test, two (2)
- C. Evaluators for semifinalist activity, two (2) or more

MATERIALS

- A. Coordinator's notebook, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each evaluator
 - 2. Official rating forms
 - 3. List of entries with finalist report
 - 4. List of evaluators/assistants
 - 5. Semifinalist list for posting
 - 6. Results envelope
- B. Technical Sketching and Application test and answer key
- C. Scan machine and scannable answer forms
- D. Current Technical Sketching and Application problems for semifinalists
- E. Graph paper—twelve (12) sets of two (2) for each semifinalist
- F. One (1) drawing surface per semifinalist (e.g., manila folder, clipboard)
- G. Tables and chairs for participants
- H. Tables and chairs for evaluators
- I. Marking pens for evaluators

RESPONSIBILITIES

- A. Upon arrival at the conference, report to the CRC room and check the contents of the coordinator's notebook. Review the event guidelines and check to see that enough evaluators/assistants have been scheduled.

- B. Inspect the area(s) in which the written test 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 your 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. Begin the event at the scheduled time by closing the doors and checking the entry list. All participants and assistants should be in the room at this time. Participants not present may be disqualified. In order to compete, participants must be on the entry list or must have approval of the CRC chairperson.
- E. Administer the written test. Allow sixty (60) minutes.
- F. 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; all must initial either of these actions on the rating form.
- G. Score the test. Prepare a list of the twelve (12) semifinalists and submit it to the CRC chairperson for posting.
- H. Inspect the area(s) in which the semifinalist event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.
- I. Meet with your semifinalist evaluators to review time limits, procedures, and regulations. If questions arise that cannot be answered, speak to the event manager before the event begins.
- J. Administer the on-site problems. Allow ninety (90) minutes.
- K. Evaluators collect and review each semifinalist's solution to the problems.
- L. Evaluators tally, sign, and submit rating forms to the event coordinator. Evaluators discuss and break any ties.
- M. Ensure that all rating forms have been completed, reviewed, and signed before the evaluators are dismissed.
- N. Complete and submit the finalist report and all related forms in the results envelope to the CRC room.
- O. If necessary, manage security and the removal of materials from the area.



Participant/Team ID# _____

Record scores in the column spaces below.

TECHNICAL SKETCHING AND APPLICATIONS

2015 & 2016 OFFICIAL RATING FORM

HIGH SCHOOL

Written Test (50 points)

SUBTOTAL (50 points)

Semifinalist Solution (50 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 far 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.)			
Line quality (X1)	Line weight, thickness, and quality are poor, inaccurate, and not uniform.	Line weight, thickness and quality are somewhat adequate and uniform.	Line weight, thickness, and quality are consistently accurate and uniform.
Accuracy of solution (X2)	The solution is missing important information and details.	The solution is accurate, with most of the necessary information and details included.	The solution is accurate and complete, with all necessary information and details included.
Dimensioning accuracy (X1)	Dimensioning practices are inaccurate, with many necessary measurements and notes missing.	Most necessary dimensions and notations are included, accurate, and appropriately placed.	All necessary dimensions and notations are included and appropriately placed.
Neatness, letter uniformity, and general appearance (X1)	The solution displays minimal effort in neatness, letter uniformity, and general appearance; poor quality is evident.	The solution is adequate and exhibits good effort, with some attention to detail.	The solution is exemplary in neatness, letter uniformity, appearance, and attention to detail.
			SUBTOTAL (50 points)

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

Indicate the rule violated: _____

(To arrive at TOTAL score, add any subtotals and subtract rules violation points, as necessary. Check your math twice!) **TOTAL (100 points)**

Comments:

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

Evaluator

Printed name: _____

Signature: _____