

# INVENTIONS AND INNOVATIONS



## OVERVIEW

Applying leadership and 21<sup>st</sup> century skills, participants research and brainstorm the need for an invention or innovation of a device, system, or process related to the current year's theme, which will be posted on the [TSA website](#) under *Themes & Problems*. Team entries must include documentation of the team's work through a static display and a model/prototype. Semifinalists give a "sales pitch" presentation to a panel of judges (who act as venture capital investors) to persuade the panel to invest in their invention/innovation.

## ELIGIBILITY

### PRELIMINARY ROUND

One (1) team of three (3) to six (6) individuals per chapter may participate.

## TIME LIMITS

Ten (10) minutes are allowed for the semifinal presentation and interview broken down as follows:

- A. One (1) minute for set-up
- B. Seven (7) minutes for the presentation
- C. Two (2) minutes to respond to questions from judges

## ATTIRE

TSA competition attire is required.

## PROCEDURE

### PRE-CONFERENCE

- A. Participants access the annual theme on the [TSA website](#) under *Themes & Problems*.
- B. Participants concentrate their efforts in researching and identifying a need that has the potential for the invention/innovation of a device, system, or process.
- C. Participants design a scaled model/prototype, which may be a conceptual model or a working model of a device, system, or process.
- D. Participants document the design through the creation of a static display.

- E. Participants prepare a "sales pitch" presentation that further explains the invention/innovation to a panel of judges acting as venture capitalists.

### PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
  - 1. The static display
  - 2. The model/prototype
- B. Entries are evaluated by the judges with neither students nor advisors present based on the following criteria:
  - 1. Judges score the static display criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
  - 2. Judges score the Documentation Portfolio criteria of those top twenty-four (24) contestants to determine the top twelve (12) semifinalists.
- C. A list of twelve (12) semifinalists (in random order) is posted.

### SEMIFINAL ROUND

- A. One (1) team representative reports at the time and place stated in the conference program to sign up for a presentation time.
- B. Three (3) team representatives report at least ten (10) minutes prior to their assigned time to the designated place for their presentation.
- C. Semifinalist team representatives make a "sales pitch" presentation to the judges (venture capitalists).
- D. The "sales pitch" presentation begins on the timekeepers signal.
- E. Team representatives pick-up their entry from the display area at the time and place stated in the conference program.
- F. The top ten (10) finalists are announced at the awards ceremony.

## REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21<sup>st</sup> 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.

### PRE-CONFERENCE

- A. The invention/innovation entry (of a device, system, or process) must be the result of an identified need.
- B. Static display:
  1. The size of the display (including the model/prototype) for the invention/innovation may not exceed 15" deep x 3' wide x 4' high.
  2. Content:
    - a. Invention name
    - b. Description of the invention/innovation
    - c. Explanation of the necessity
    - d. Description of brainstorming process
    - e. Drawings or illustrations of the invention/innovation. If the entry contains images of people, proof of consent must be included on the back of the display. Images of minors require parental consent (see Forms Appendix)
    - f. Process of building the model/prototype
  3. A/C electricity may not be used.
  4. If the display and/or model/prototype requires power, they must be powered by dry-cell batteries or photo-voltaic cells.
    - a. The power supply must physically fit within the display dimensions.
    - b. All power must be switched off once the team has completed set-up.
    - c. If teams want judges to activate any electronic device in their model/prototype/display, complete instructions must be provided to judges on how to power up the model/display.
  5. The display must be presented as if it were in a product show case geared toward an audience of venture capitalists.
- C. Model/Prototype:
  1. The model/prototype may be a scaled version of the invention/innovation idea.
  2. The idea should be realistic and have the potential to be workable.
  3. The following options may be used to provide direct current electrical power for the model/prototype when it is demonstrated during the semifinalist presentation. No other electrical source may be used.
    - a. Up to 4 "C" or "D" batteries, OR
    - b. Up to 8 "AA" or "AAA" batteries
- D. Once the display set-up time frame has closed, participants may not re-enter the event area.
- E. Violation of the following will result in disqualification:
  1. No viruses, live plants, or animals may be used as part of the display.
  2. No harmful or illegal substances may be displayed

### PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
  1. The static display
  2. The model/prototype
- B. Entries are independently reviewed by judges.
- C. A list of twelve (12) semifinalist teams (in random order) is posted.

### SEMIFINAL ROUND

- A. Up to three (3) representatives from each team report at the time and place stated in the conference program for the "sales pitch" presentation.
- B. Using leadership and/or 21<sup>st</sup> century skills, the goal of the team is to convince the judges that the invention/innovation is needed and has real-world potential.
- C. Representatives may reference their display and documentation during the presentation and interview.
- D. Teams may bring and use audio/visual materials or a laptop for their presentation. AC power will not be provided or available. Projectors and screens are not permitted.

## E. Time limits:

1. One (1) minute for set-up
2. Seven (7) minutes for presentation
3. Two (2) minutes to respond to questions from judges
4. A five-(5) point deduction will be incurred for any time infraction.

**EVALUATION****PRELIMINARY ROUND****Tier 1**

A. The static display

**Tier 2**

B. The model/prototype

**SEMIFINAL ROUND**

A. The “sales pitch” presentation

Refer to the official rating form for more information.

**STEM INTEGRATION**

This event has connections to the STEM areas of Science, Technology, Engineering, and Mathematics.

**LEADERSHIP AND 21<sup>ST</sup> CENTURY SKILLS DEVELOPMENT**

This event provides opportunity for students to build and develop leadership and 21<sup>st</sup> 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:

- Commercial and industrial design
- Engineer
- Entrepreneur
- Marketing strategist
- Product designer
- Small business owner

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## 2024 & 2025 OFFICIAL RATING FORM

### MIDDLE 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.

- ☐ TIER 1 – Display is present
- ☐ TIER 2 – Model/prototype is present
- ☐ ENTRY NOT EVALUATED

TIER 1 – STATIC DISPLAY (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
<b>Display</b> (X2)	Display is not complete; the information is irrelevant to the invention/innovation, and the display is lacking in aesthetic quality.	Display includes most components; the idea featured is adequately described; the quality is aesthetically pleasing.	Display is complete; information presented promotes the invention/innovation exceptionally well, and the quality is aesthetically pleasing; the display incorporates the required interactive components.	
<b>Need and Description</b> (X2)	Description of need for invention/innovation is provided, but is unclear and unconvincing; there is not enough detail; invention/innovation is not sensible, practical, or rational in nature.	Description of need for invention/innovation is generally convincing, with some detail; invention/innovation is realistic and generally meets the need as defined	Description of need for invention/innovation is fully explained, defined, and detailed precisely; invention/innovation accurately and convincingly meets the need as defined.	
<b>Brainstorming Process</b> (X1)	Description of the brainstorming process provides little or no details.	Description of the brainstorming process is provided, and includes some detail about the process.	There is clear evidence that brainstorming served as a key component of the process.	
<b>Illustration/ Drawings</b> (X1)	Only one or two illustrations/ drawings of the model/prototype are displayed, with little or no evidence that a model/prototype was well-developed or utilized.	Adequate illustrations/drawings of the model/prototype are included and are generally representative of the concept.	High quality illustrations/drawings of the model/prototype are provided and documented completely.	
<b>TIER 1 – STATIC DISPLAY SUBTOTAL (60 points)</b>				
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: _____				
<b>TIER 1 – SUBTOTAL (60 points)</b>				

TIER 2 – MODEL/PROTOTYPE (50 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
<b>Craftsmanship</b> (X1)	The model/prototype shows minimal craftsmanship in design and creation.	The model/prototype shows adequate craftsmanship in design and creation.	The model/prototype shows exceptional craftsmanship in design and creation.	
<b>Feasibility</b> (X1)	The model/prototype is not realistic and does not have the potential to be workable.	The model/prototype is mostly realistic, but would need some changes to be fully workable.	The model/prototype is very realistic and is completely workable in it's current iteration.	
<b>Theme</b> (X1)	There is minimal association to the annual theme and/or the model/prototype could not meet the identified need.	There is adequate association to the annual theme and the model/prototype could potentially meet the identified need.	The model/prototype appropriately meets the identified need and is highly associated to the annual theme.	
<b>Product Overall Marketability</b> (X2)	The model/prototype does not represent a marketable product and would not be of interest to venture capitalists.	The model/prototype is adequately marketable and would be of slight interest to venture capitalists.	The model/prototype is high marketable and would be of great interest to venture capitalists.	
<b>TIER 2 – MODEL/PROTOTYPE SUBTOTAL (50 points)</b>				
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: _____				

<b>PRELIMINARY SUBTOTAL (110 points)</b>	
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SEMIFINAL SALES PITCH PRESENTATION/INTERVIEW (60 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
<b>Organization</b> (X1)	Participants seem unorganized and unprepared for the presentation; illogical explanation of the need and solution is presented.	Participants are generally prepared for the presentation; explanation of the need and solution are communicated and generally organized.	The presentation is logical, well organized, and easy to follow; the need and solution are communicated in a concise manner.	
<b>Knowledge</b> (X1)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit a basic understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the concepts in their project.	
<b>Articulation</b> (X1)	Communication of the design process is unclear, unorganized, and/or illogical; leadership and/or 21 <sup>st</sup> century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 <sup>st</sup> century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 <sup>st</sup> century skills are clearly evident.	
<b>Creativity of Presentation</b> (X2)	Presentation lacks imagination, originality, and detail; there is limited use of audio/visual materials.	Presentation is generally effective, innovative, and convincing; use of audio/video materials provides information about the invention/innovation.	Presentation is inspiring, inventive, resourceful, and completely convincing; use of audio/visual materials is exceptional in providing information about the invention/innovation.	

SEMIFINAL SALES PITCH PRESENTATION/INTERVIEW (60 points) – continued				
Team Participation (X1)	The majority of the delivery is made by one member of the team; the partner(s) are disengaged from the presentation.	Team members are generally engaged in the process, though one member may take on more responsibility than the other(s).	Team members are actively involved in the presentation and responses to the interview questions; there is shared responsibility among the team members.	
SEMIFINAL SALES PITCH PRESENTATION/INTERVIEW SUBTOTAL (60 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: _____				
TIME DEDUCTIONS				
A five-(5) point deduction will be incurred for any time infraction.				
SEMIFINAL SUBTOTAL (60 points)				
To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.				TOTAL (170 points)

Comments:

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

JUDGE

Printed name: \_\_\_\_\_ Signature: \_\_\_\_\_



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## EVENT COORDINATOR INSTRUCTIONS

### PERSONNEL

- A. Event coordinator
- B. Judges:
  - 1. Preliminary round, two (2) or more
  - 2. Semifinal round, two (2) or more
- C. Assistants, two (2) or more

### 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. Stick-on labels for identifying entries
  - 5. Results envelope with coordinator forms
- B. Display tables for entries
- C. Table and chairs for team presentations, as needed
- D. Stopwatch
- E. Measuring tape
- F. Table and chairs for event coordinator and judges

### RESPONSIBILITIES

#### 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 hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the event manager before the event begins.

### CHECK-IN

- A. Check-in the entries at the time stated in the conference program.
- B. No more than two (2) team representatives may check-in the:
  - 1. Static display
  - 2. Model/prototype
- C. Late entries are considered on a case-by-case basis and only when the 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. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- F. Each entry must include the team's identification number in the upper right-hand corner of the display and somewhere visible on the model/ prototype.

### PRELIMINARY ROUND

- A. Judges independently review the entries.
  - 1. The initial round of judging scores the static display entries to determine the top twenty-four (24) participants.
  - 2. The second round of judging scores the model/ prototype of the twenty-four (24) identified participants based on the initial round of judging to determine the twelve (12) semifinalists.
- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
  - 1. To deduct twenty percent (20%) of the total possible points in this round
  - 2. To disqualify the entry
 The event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- C. Judges determine the twelve (12) semifinalists and discuss and break any ties.
- D. Submit the semifinalist results and all related forms in the results envelop to the CRC room.

- E. Create a sign-up sheet for semifinalist presentations and communicate any instructions to the semifinalist participants.

### SEMIFINAL ROUND

- A. Semifinalists report to sign-up for the presentation at the time and place stated in the conference program.
- B. Check in semifinalists and confirm with the teams their order of presentation and the procedure. Team representatives should report at least ten (10) minutes prior to their assigned time to the designated place for their presentation.
- C. Manage the presentations and interviews.
- D. Discuss rule violations and have all relevant parties initial the rating form.
- E. Judges independently assess the semifinal presentation and interview.
- F. Judges determine the top ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. If necessary, manage security and the removal of materials from the event area.