

OVERVIEW

Participants conduct research on a contemporary medical technology issue of their choosing, document their research and solution, and present their documentation through a static display. The entry may include student research or a re-creation or simulation of research performed by the scientific community. A student-designed model or prototype depicting an aspect of the issue will also be included in addition to the display. Semifinalists give a presentation.

ELIGIBILITY

1. Three (3) teams per state, two (2) or more individuals per team may participate.
2. The semifinalist presentation must include two to three (2-3) members of a team.

TIME LIMITS

Semifinalists will be allowed up to ten (10) minutes for a presentation.

LEAP

A team LEAP Response is required for this event and must be submitted at event check-in.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

1. Team members choose a contemporary medical technology issue they would like to research.
2. Team members prepare their documentation display and prototype according to the regulations for this event.

PRELIMINARY ROUND

1. Participants check in the following at the time and place stated in the conference program:
 - a. The documentation display
 - b. The model/prototype
2. No more than two (2) team members set up the display.
3. Entries are reviewed by judges with neither students nor advisors present.
4. A list of twelve (12) semifinalist teams (in random order) will be posted.

SEMIFINAL ROUND

1. A representative from each semifinalist team will report at the time and location stated in the conference program to schedule a presentation. Two to three (2-3) representatives from each semifinalist team report to the event area at the time scheduled for the team's presentation.
2. Semifinalist team representatives make their presentation and may be asked questions by judges.
3. The LEAP Response will be judged for semifinalist teams.
4. Team members pick up their entry from the display area at the time and place stated in the conference program.
5. Ten (10) finalists will be announced during the conference award ceremony.

REGULATIONS AND REQUIREMENTS

PRE-CONFERENCE

- A. Team members must understand the fundamental concepts and principles of the contemporary medical technology issue they select. Research should focus on significant impacts (opportunities and risks) on the environment, economy, and society, as well as any important ethical considerations.

B. Documentation/Display:

1. Documentation materials should be exhibited in a creative and effective manner on a stand-alone display.
2. Definition and explanation of the issue and solution.
3. An explanation of the impacts of the issue, such as relevance to environmental, economic, social, and/or ethical considerations.
4. Supporting information such as logs, graphs, sketches, drawings, illustrations, photographs.
5. A list of references and credible resources should be secure in a clear report cover (click [here](#) for a sample), along with the LEAP Response form; pages as needed.
6. The size of the display may not exceed 15" deep x 3' wide x 4' high.
7. The display must incorporate the use of design principles.
8. Appropriate graphic representations may be used in the display.
9. No viruses, live plants, or animals or harmful/illegal substances may be used as a part of the display.

C. Model/Prototype of the solution:

1. Participants must create a model or prototype of the medical technology solution chosen.
2. Models/prototypes may be 3D printed or CNC manufactured.
3. Models may not be commercially purchased or obtained from a medical facility or other retail supplier.
4. A/C electricity may not be used.
5. Any power source used must fit within the maximum display area.
6. If operating instructions are necessary (including electronics), they must be clearly displayed.
7. Photographic verification of design and creation of the model or prototype must be included.
8. Dry cell or photo-voltaic cells may be used for power, if desired.

PRELIMINARY ROUND

- A. Once the display set-up time frame has closed, no one may re-enter the event area.
- B. Violation of the following will result in disqualification:
 1. No viruses, live plants, or animals may be used as a part of the display.
 2. No harmful or illegal substances may be displayed.

SEMIFINAL ROUND

- A. Each team must send two to three (2-3) representatives to a semifinalist presentation, which will last no longer than ten (10) minutes.
- B. The LEAP Response:
 1. Teams document the leadership skills the team has developed and demonstrated while working on this event and on a non-competitive event leadership experience.
 2. Find the specific LEAP Response regulations in the LEAP Program section of this guide and on the [TSA website](#).

EVALUATION

PRELIMINARY ROUND

1. The documentation and the display

SEMIFINAL ROUND

1. The presentation and content and quality of the LEAP Response

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.

CAREERS RELATED TO THIS EVENT

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

- Dietitian
- Doctor
- Medical technologist
- Nurse
- Pharmacist
- Prosthetics practitioner

MEDICAL TECHNOLOGY

2020 & 2021 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.

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- Display Board
 - Reference/Resource Page is Included
 - Model/prototype is present
 - Completed LEAP Response is present
 - ENTRY NOT EVALUATED

DOCUMENTS/DISPLAY (90 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Definition and explanation of the issue and solution (X1)	Unclear definition and explanation of the issue are evident; it is difficult to understand the solution being communicated; an illogical explanation is presented.	Issue is defined and explained adequately; an explanation of the solution is adequately communicated.	There is evidence of a clear and concise definition and explanation of the issue; explanation of the solution is presented and communicated in an organized, clear, and concise manner.	
Explanation of impacts (X2)	Explanation is missing a discussion of the issue’s relevance to environmental, economic, social, and/or ethical considerations.	Explanation addresses some of the issues relevant to environmental, economic, social, and/or ethical considerations.	Explanation includes a full discussion of the issue’s relevance to environmental, economic, social, and/or ethical considerations.	
Supporting information (X1)	Support information does not help to clarify documentation, and/or it is of little significance to the issue.	Support information is appropriate and helps supplement the documentation by providing clarity to the issue.	Support information is highly effective and of excellent quality.	
Research, references, and resources (X1)	Documentation lacks an adequate research base, and/or very few credible sources are referenced.	Research is conducted appropriately, with adequate credible sources.	A comprehensive research base that includes credible sources is evident.	
Communication of issue (X1)	It is difficult to understand the issue being communicated; an illogical explanation presented.	The issue is communicated and thoughts are organized somewhat concisely.	The issue is communicated in an organized, clear, and concise manner.	
Communication of solution (X1)	It is difficult to understand the solution being communicated; an illogical explanation is presented.	The solution is communicated and thoughts are organized somewhat concisely.	The solution is communicated in an organized, clear, and concise manner.	
Creativity (X1)	The display lacks creativity; no, or very few, design principles are integrated in the display.	Some elements of creativity exist in the display, and essential design principles are generally evident.	The display exudes creativity; essential design principles and elements are well integrated.	

DOCUMENTS/DISPLAY (90 points) – continued				
Aesthetics and artisanship (X1)	Work is unorganized and sloppy; display seems to be an afterthought or thrown together.	Display shows an organized presentation of the issue.	Display is exemplary in logically communicating important data.	
DOCUMENTS/DISPLAY SUBTOTAL (90 points)				

MODEL/PROTOTYPE (40 points)				
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Model/prototype (X1)	Model/prototype is present but not complete or is lacking in overall quality.	Model/prototype is present and is good quality but missing detail to adequately portray the project's focus.	Model/prototype is present and shows great detail in portraying the project's focus.	Record scores in the column spaces below.
Communication of solution (X1)	It is difficult to understand the solution being communicated; an illogical explanation is presented.	The solution is communicated and thoughts are organized somewhat concisely.	The solution is communicated in an organized, clear, and concise manner.	
Creativity (X1)	The model/prototype lacks creativity; no, or very few, design principles are integrated in the display.	Some elements of creativity exist in the model/prototype, and essential design principles are generally evident.	The model/prototype exudes creativity; essential design principles and elements are well integrated.	
Aesthetics and artisanship (X1)	Work is unorganized and sloppy; model/prototype seems to be an afterthought or thrown together.	Model/prototype shows an organized presentation of the issue.	Model/prototype is exemplary in logically communicating important data.	
MODEL/PROTOTYPE SUBTOTAL (40 points)				

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

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (130 points)
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SEMIFINAL PRESENTATION (79 points)				
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization (X1)	Participants seem unorganized and unprepared for the presentation, with an illogical explanation of the problem and solution.	Participants are generally prepared for the presentation; explanation of problem and solution are communicated and generally organized.	The presentation is logical, well organized, and easy to follow; the problem and solution are communicated in an organized and concise manner.	Record scores in the column spaces below.

SEMIFINAL PRESENTATION (79 points) – continued				
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit an understanding of the concepts in their project.	Participants show clear evidence of a thorough understanding of the project.	
Articulation (X1)	The presentation/interview is full of illogical thoughts that lack clarity, and/or there is insufficient information provided describing the project.	The presentation/interview is somewhat logical, generally easy to follow, and/or there is sufficient information provided describing the project.	The presentation/interview is clear, concise, and there is ample information provided describing the project.	
Team participation (X1)	The majority of the presentation is made by one member of the team; partner(s) may be disengaged from the presentation.	Team members generally are engaged in the presentation, though one member may take on more responsibility than the other(s).	Team members are actively involved in the presentation and responses to questions; there is shared responsibility among team members.	
Delivery (X1)	The team is verbose and/or uncertain in its presentation; participants' posture, gestures, and lack of eye contact diminish the presentation.	The team is somewhat well-spoken and clear in its presentation; participants' posture, gestures, and eye contact are acceptable in the presentation.	The team is well-spoken and distinct in its presentation; participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation.	
LEAP Response (19 points; 10% of the total event points)	The team's efforts are not clearly communicated, lack detail, and are unconvincing; few, if any, attempts are made to identify and incorporate the SLC Practices.	The team's efforts are adequately communicated, include some detail, are clear, and are generally convincing; identification and incorporation of the SLC Practices are satisfactory.	The team's efforts are clearly communicated, fully-detailed, and convincing; identification and incorporation of the SLC Practices are excellent.	
SEMIFINAL PRESENTATION SUBTOTAL (79 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: _____

SEMIFINAL SUBTOTAL (79 points)

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. TOTAL (209 points)

Comments:

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

JUDGE

Printed name: _____ Signature: _____

MEDICAL TECHNOLOGY EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

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

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) for the coordinator and 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. Measuring tape for judges
- C. Display tables for entries
- D. Table and chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

1. Attend the mandatory coordinator's meeting at the designated time and location.
2. Report to the CRC room and check the contents of the coordinator's packet.
3. Review the event guidelines and check to see that enough personnel have been scheduled.
4. Inspect the area(s) in which the event is to be held for appropriate set-up, including room size, tables, chairs, etc. Notify the event manager of any potential problems.
5. At least one (1) hour before the event is scheduled to begin, meet with judges to review time limits, procedures, and regulations. If questions arise that cannot be answered, speak to the event manager before the event begins.

PRELIMINARY ROUND

1. Check in the entries at the time stated in the conference program.
2. No more than two (2) Team members set up and check in:
 - a. Documentation Display
 - b. Model/Prototype
3. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
4. In order to compete, participants must be on the entry list or must have CRC approval.
5. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
6. Each entry must include the participant's identification number in the upper right-hand corner of the entry.
7. Prior to judging, position displays for viewing if needed.
8. Judges individually evaluate the entries.
9. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - To deduct twenty percent (20%) of the total possible points in this round
 - To disqualify the entry

The event coordinator, judges and CRC manager must all initial either of the violations on the rating form.
10. Judges determine the twelve (12) semifinalists and discuss and break any ties.
11. Submit the semifinalist results and all related forms in the results envelope to the CRC room.

SEMIFINAL ROUND

1. Meet with judges to review time limits, procedures, and regulations for the semifinalist portion of the event.
2. Conduct semifinalist presentations.
3. If judges ask questions, they should be the same questions for each team for the purpose of comparing one team to another.
4. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
5. Judges determine the ranking of the ten (10) finalists and discuss and break any ties.
6. Submit the finalist results and all related forms in the results envelope to the CRC room.
7. If necessary, manage security and the removal of materials from the event area.