



## OVERVIEW

Participants conduct research on a contemporary medical technology issue of their choosing, document their research and solution, and create a display. The entry may include student research or a re-creation or simulation of research performed by the scientific community. If appropriate, a model or prototype depicting an aspect of the issue may be included in the display. Semifinalists give a presentation/interview.

## ELIGIBILITY

- Three (3) teams per state, two (2) or more individuals per team may participate.
- 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 (see LEAP Program).

## ATTIRE

TSA competition attire is required.

## PROCEDURE

### Preliminary Round

1. Team members choose a contemporary medical technology issue they would like to research.
2. Team members prepare their documentation and display according to the regulations below.
3. Participants check in their entry and LEAP Response at the time and place stated in the conference program.
4. No more than two (2) team members set up the display.
5. Entries are reviewed by judges. Neither students nor advisors are present at this time.
6. A list of twelve (12) semifinalist teams (in random order) will be posted.

### Semifinal Round

1. 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. No more than two (2) 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

### Preliminary Round

- 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 materials (comprising a "portfolio") are required and should be secured in a clear front report cover. (Click [here](#) for a sample.)
- C. The report cover must include the following single-sided, 8½" x 11" pages, in this order:
  - 1. Title page with the event title, conference city and state, the year, and the team ID number; one (1) page
  - 2. Table of contents
  - 3. Definition and explanation of the issue and solution; two (2) pages
  - 4. An explanation of the impacts of the issue, such as relevance to environmental, economic, social, and/or ethical considerations; maximum three (3) pages
  - 5. Supporting information such as logs, graphs, sketches, drawings, illustrations, photographs, etc.; maximum four (4) pages
  - 6. Plan of Work log that indicates preparation for the event, as noted by date, task, time involved, team member responsible, and comments (See Plan of Work log in the Forms Appendix); pages as needed
  - 7. A list of references and credible resources; a minimum of three (3) different types of resources must be used; examples may include but are not limited to books, interviews, websites, magazines, and professional journals; pages as needed
- D. Display:
  - 1. The size of the display may not exceed 15" deep x 3' wide x 4' high.
  - 2. The display must incorporate the use of design principles.
  - 3. Appropriate graphic representations may be used in the display.
  - 4. Information used in the display must represent the medical issue being presented.
  - 5. Once the display set-up time frame has closed, no one may re-enter the event area.
  - 6. No viruses, live plants, or animals may be used as a part of the display.**
  - 7. No harmful or illegal substances may be displayed.**
  - 8. Violation of regulations seven (7) or eight (8) above will result in disqualification.**
- E. Model/Prototype of the solution:
  - 1. Participants may 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.**
  - 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.

### 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

Evaluation is based on:

1. Preliminary Round: The documentation and the display
2. Semifinal Round: 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 or more of the careers below:

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



# MEDICAL TECHNOLOGY EVENT COORDINATOR'S 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

- A. 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 judges 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.
- B. Preliminary Round:
  - 1. Check in the entries at the time stated in the conference program.
  - 2. Anyone reporting that is not on the entry list may check in only after official notification is received from the CRC.
  - 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. Requirements for attire do NOT apply during check-in only on the first day of the conference.
  - 5. Each entry must include the participant's identification number in the upper right-hand corner of the entry.

6. Position displays for viewing.
  7. Judges individually evaluate the entries.
  8. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and CRC manager to determine either
    - to deduct twenty percent (20%) of the total possible points in this round or
    - to disqualify the entry
    - The event coordinator, judges and CRC manager must all initial either of these actions on the rating form.
  9. Judges determine the twelve (12) semifinalists and discuss and break any ties.
  10. Submit the semifinalist results and all related forms in the results envelope to the CRC room.
- C. 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. Should judges ask questions, they should be the same questions for each team for the purpose of comparing one team to another.
  4. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and CRC manager to determine either
    - to deduct twenty percent (20%) of the total possible points in this round or
    - to disqualify the entry
    - The event coordinator, judges and CRC manager must all initial either of these actions on 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.



Participant/Team ID# \_\_\_\_\_

# MEDICAL TECHNOLOGY

2018 & 2019 OFFICIAL RATING FORM

MIDDLE SCHOOL

## 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 blank and place a check mark in the box labeled ENTRY NOT EVALUATED. This will disqualify the entry and it will not be judged.

- Project portfolio is present
- Display board is present
- Model/prototype is present
- Completed LEAP Response is present
- ENTRY NOT EVALUATED

## Criterion Performance Levels

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
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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.

## Documentation (70 points)

<b>Portfolio</b> See Regulation C (X1)	Portfolio is unorganized and/or is missing three or more components.	Portfolio contains most components and is adequately organized.	Portfolio has one or no components missing, and content and organization are clearly evident.
<b>Definition and explanation of the issue and solution</b> (X2)	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 is presented and communicated in an organized, clear, and concise manner.
<b>Research, references, and resources</b> (X1)	Documentation lacks an adequate research base, and/or very few credible sources are referenced.	Research is conducted appropriately, with adequate credible sources.	Comprehensive research base that includes credible sources is evident.
<b>Explanation of impacts</b> (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.
<b>Supporting information</b> (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.

**DOCUMENTATION SUBTOTAL (70 points)**

## Display (40 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
<b>Communication of issue</b> (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.

Record scores in the column spaces below.



Display continued (40 points)			
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
<b>Communication of solution</b> (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.
<b>Creativity</b> (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.
<b>Aesthetics and artisanship</b> (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.
<b>DISPLAY SUBTOTAL (40 points)</b>			
Model/Prototype (40 points)			
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
<b>Communication of issue</b> (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.
<b>Communication of solution</b> (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.
<b>Creativity</b> (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.
<b>Aesthetics and artisanship</b> (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.
<b>MODEL/PROTOTYPE SUBTOTAL (40 points)</b>			
Rules violations (a deduction of 20% of the total possible points for the above sections) must be initiated by the evaluator, coordinator and manager of the event. Record the deduction in the space to the right.			
Indicate the rule violated: _____			
<b>PRELIMINARY SUBTOTAL (150 points)</b>			
Semifinal Presentation (81 points)			
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
<b>Organization</b> (X1)	Participants seem unorganized and unprepared for the presentation; illogical explanation of the project is presented.	Participants are generally prepared for the presentation; explanation of the project is communicated and generally organized.	The presentation is logical, well organized, and easy to follow; the project explanation is communicated in a concise manner.
<b>Articulation</b> (X1)	The presentation is full of illogical thoughts that lack clarity, and/or there is insufficient information provided describing the project.	The presentation is somewhat logical, easy-to-follow, and/or there is sufficient information describing the project.	The presentation is clear, concise, and there is ample information provided describing the project.
<b>Knowledge</b> (X2)	Participants seem to have very little understanding of the concepts in their project; answers to questions may be vague.	Participants exhibit an understanding of the concepts in their project; they answer questions adequately.	Participants present clear evidence of a thorough understanding of their project; they answer questions well and confidently.



Semifinal Presentation continued (81 points)			
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
<b>Team participation</b> (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.
<b>Delivery</b> (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.
<b>LEAP</b> (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.
<b>SEMIFINAL PRESENTATION SUBTOTAL (81 points)</b>			
Rules violations (a deduction of 20% of the total possible points for the semifinalist section) must be initiated by the evaluator, coordinator and manager of the event. Record the deduction in the space to the right.			
Indicate the rule violated: _____			
<b>SEMIFINAL SUBTOTAL (81 points)</b>			
(To arrive at the TOTAL score, add the PRELIMINARY SUBTOTAL and the SEMIFINAL SUBTOTAL.)			<b>TOTAL (231 points)</b>
Comments:			
I certify these results to be true and accurate to the best of my knowledge.			
Evaluator			
Printed name: _____		Signature: _____	