BIOTECHNOLOGY

OVERVIEW

Advances in science have had a tremendous impact in the area of biotechnology, helping us grow more disease resistant plants, using our planet's resources more wisely, and understanding and using genetic engineering to our benefit. In this event, participants conduct research on a contemporary biotechnology issue of their choosing, document their research (student-performed research or a re-creation or simulation of research performed by the scientific community), and create a display. If appropriate, a model or prototype depicting an aspect of the issue may be included in the display. Semifinalist teams create a presentation and are interviewed about their topic.

Biotechnology is "any technique that uses living organisms, or parts of organisms, to make or modify products, improve plants or animals, or to develop microorganisms for specific purposes." – from *Standards for Technological Literacy*, ITEEA.

ELIGIBILITY

Three (3) teams per state may participate.

TIME LIMITS

Ten (10) minutes are allowed for the semifinalist presentation/interview.

LEAP REPORT

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 select a contemporary issue concerning biotechnology.

2. Team members research the issue using resources, including—but not limited to—books, interviews, websites, magazines, professional journals, etc.

3. Team members prepare their documentation and display according to the regulations.

PRELIMINARY ROUND

1. Participants report to the event area at the time and place stated in the conference program and submit a hard copy of the LEAP Response with no report cover.

2. No more than two (2) team members set up the display.

3. Entries are evaluated 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/interview time.

2. A minimum of two (2) and a maximum of three (3) members of each semifinalist team report to the event area at the designated time and place.

3. Semifinalist team members will use their display and documentation for reference during the presentation/interview.

4. Semifinalists are allowed ten (10) minutes for the presentation/interview.

5. The LEAP Response will be judged in addition to the semifinalist presentation/interview.

6. Team members pick up their entry from the display area at the time and place stated in the conference program.

7. Ten (10) finalists will be announced during the conference awards ceremony.

REGULATIONS AND REQUIREMENTS

PRE-CONFERENCE

A. Students must understand the fundamental concepts and principles of the contemporary biotechnology issue they research. Research about the issue should focus on significant impacts (opportunities and risks) on the environment, economy, and society, as well as any important ethical considerations.

B. Documentation:

1. Documentation materials (comprising a "portfolio") are required and must be secured in a clear front report cover (click here for a sample) including the following single-sided, 8½" x 11" pages, in this order:

   a. Title page that includes the event title, the conference city and state, the year, and the team/chapter ID number; one (1) page

   b. Table of contents

   c. Definition and explanation of the issue; one (1) page

   d. Research base: An explanation of the importance of the issue in human life today, including possible problems and solutions; maximum three (3) pages.

   e. Support materials such as logs, graphs, sketches, drawings, illustrations, photographs, etc.; maximum four (4) pages

   f. Plan of Work log that indicates preparation for the event, as noted by date, task, time involved, team member responsible, and comments (see Forms Appendix: Plan of Work Log)

   g. A list of references and credible resources; a minimum of three (3) different types of resources must be used; examples of resources include, but are not limited to, books, interviews, professional journals, websites, magazines, etc; pages as needed.

   h. Work must be original or cited. For details, refer to the General Rules and Regulations.

C. Display guidelines:

1. The size of the display may not exceed 15" deep x 3' wide x 4' high.

2. Models or prototypes, if included, must fit within the allotted display space.

3. A/C electricity may not be used.

4. Dry cell or photo-voltaic cells may be used for power, if desired.

5. Any power source used must fit within the maximum display area.

6. If operating instructions are necessary, they must be clearly displayed.

7. Violation of the following will result in disqualification:

   a. No viruses, live plants, or animals may be used as a part of the display.

   b. No harmful or illegal substances may be displayed.

SEMIFINAL ROUND

A. The semifinalist presentation/interview must include two to three (2-3) team members.

B. No more than two (2) team members may check in the entry and documentation.

C. Semifinalist team members will use their display and documentation for reference during the presentation/interview.

D. 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

1. The documentation
2. The display
3. The semifinalist presentation/interview
4. The 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:

- Botanist
- Chemical engineer
- Food scientist
- Molecular biologist
- Plant geneticist

BIOTECHNOLOGY
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.

☐ Documentation is present
☐ Display is present
☐ Completed LEAP Response is present
☐ ENTRY NOT EVALUATED

DOCUMENTATION (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	
Portfolio (X1)	Portfolio is unorganized and/or missing three (3) or more components.	Portfolio has most components and it is somewhat organized.	Only one (1) or none of the components are missing in the portfolio; content and organization are clearly evident.	
Definition and explanation of issue (X1)	Definition and explanation of the issue are unclear.	Issue is defined and explained appropriately.	Clear and concise definition and explanation of the issue are evident.	
Research base (X1)	Research is inadequate, and/or very few credible sources are referenced.	Research has been conducted appropriately, with some credible sources included.	Research indicates evidence of a comprehensive assortment of materials that are credible sources.	
Support materials (X1)	Support materials do not help clarify the documentation or are of little significance to the issue.	Support materials are appropriate and help supplement documentation by providing clarity to the issue.	Support materials are of excellent quality; if not original, they are cited; support materials clarify the issue.	
Quality, effectiveness, and mechanics (X1)	Portfolio appears to have been thrown together; distracting errors in punctuation, grammar, and spelling are evident in the documentation.	Portfolio is generally organized; punctuation, grammar, and spelling are generally correct, with few errors.	Work is of exceptional quality and well organized; punctuation, grammar, and spelling are correct, with no errors.	
DOCUMENTATION SUBTOTAL (50 points)				

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; the solution is acceptable.	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.	

DISPLAY (90 points) – continued

	Minimal	Adequate	Exemplary	
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 issue's relevance 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.	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 is 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.	
Aesthetics and artisanship (X1)	Display is unorganized and sloppy; display seems to be an afterthought or thrown together.	Display is somewhat organized and aesthetically pleasing.	Display is logical, organized, cohesive, and aesthetically pleasing.	
			DISPLAY SUBTOTAL (90 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: _____

PRELIMINARY SUBTOTAL (140 points)	

SEMIFINAL PRESENTATION/INTERVIEW (80 points)

Record scores in the column spaces below.

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/interview, with an illogical explanation of the problem and solution.	Participants are generally prepared for the presentation/interview; the explanation of problem and solution are communicated and generally organized.	The presentation/interview is logical, well organized, and easy to follow; the problem and solution are communicated in an organized and concise manner.	
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.	

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SEMIFINAL PRESENTATION/INTERVIEW (80 points) – continued

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.	
Delivery (X1)	The team is verbose and/or uncertain in its presentation/interview; participants' posture, gestures, and lack of eye contact diminish the delivery.	The team is somewhat well-spoken and clear in its presentation/interview; participants' posture, gestures, and eye contact result in an acceptable delivery.	The team is well-spoken and distinct in its presentation/interview; participants' posture, gestures, and eye contact result in a polished, natural, and effective delivery.	
Team participation (X1)	The majority of the presentation/interview is made by one member of the team; the partner(s) may be disengaged.	Team members generally are engaged in the process, though one member may take on more responsibility than the other(s).	All team members are actively involved in the presentation/interview.	
LEAP Response (20 points; 10% of total event points)	The team's efforts are not clearly communicated, lack detail, and/or are unconvincing; few, if any, attempts are made to identify and/or incorporate the SLC Practices and Behaviors.	The team's efforts are adequately communicated, include some detail, are clear, and/or are generally convincing; identification and/or incorporation of the SLC Practices and Behaviors is adequate.	The team's efforts are clearly communicated, fully-detailed, and convincing; identification and/or incorporation of the SLC Practices and Behaviors is excellent.	
SEMIFINAL PRESENTATION/INTERVIEW 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: _____

SEMIFINAL SUBTOTAL (80 points)	

To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. **TOTAL (220 points)**	

Comments:

_____

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

JUDGE

Printed name: _____   Signature: _____

BIOTECHNOLOGY
EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

A. Event coordinator

B. Judges:

1. Preliminary Round: Two (2) or more

2. Semifinalist Round: Two (2) or more (preferably the same judges from the preliminary round)

C. Assistant: one (1)

MATERIALS

A. Coordinator's packet, containing:

1. Event guidelines, one (1) copy 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 event 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 to begin, meet with judges and 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.

EVENT CHECK-IN

1. Check in the entries at the time and place stated in the conference program.

2. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.

3. In order to compete, participants must be on the entry list or must have CRC approval.

4. Requirements for attire do NOT apply during check-in, only on the first day of the conference.

5. Each entry must include the team's identification number in the upper right-hand corner of the entry.

6. Instruct participants to position displays for viewing.

PRELIMINARY ROUND

1. Judges independently assess the entries.

2. 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.

3. Judges determine the twelve (12) semifinalists.

4. Submit the finalist results and all related forms in the results envelope to the CRC room.

SEMIFINAL ROUND

1. Meet with semifinalist judges and review time limits, procedures, and regulations, including the LEAP judging protocol. If questions arise that cannot be answered, speak to the event manager before the event begins.

2. Oversee semifinalist presentations/interviews.

3. Judges use the same official rating form for both the preliminary and semifinal round of evaluation.

4. Judges independently assess the entries.

5. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.

6. Judges determine the ranking of the ten (10) finalists and discuss and break any ties.

7. Submit the finalist results and all related forms in the results envelope to the CRC room.

8. If necessary, manage security and the removal of materials from the event area.