




BIOTECHNOLOGY DESIGN

 Biotechnology is defined as “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/ITEA, p.149.

OVERVIEW

Participants select a contemporary biotechnology problem that relates to the current year’s published topic and demonstrate understanding of it through documented research, the development of a solution, a display, including a model or prototype (optional), and an effective multimedia presentation. Participants may choose to recreate or simulate research that previously has been performed within the scientific community.

The topic for the current school year will be posted on the TSA website under Competitions/Themes and Problems.

ELIGIBILITY

- A. Participants are limited to one (1) team, or one (1) individual, per chapter.
- B. The semifinalist presentation/interview is given by two (2) members of the team.

TIME LIMITS

- A. Entries must be started and completed during the current school year.
- B. Semifinalists are allowed up to ten (10) minutes to give a presentation, which is followed by a few minutes for questions from evaluators.
- C. The LEAP interview will be conducted as part of the semifinalist presentation/interview and will last a maximum of five (5) additional minutes.

LEAP LEADERSHIP RESUME/INTERVIEW

A Team LEAP Leadership Resume is required for this event and must be submitted at event check-in. Semifinalists will respond to interview questions related to their submitted LEAP Resume for a maximum of five (5) minutes.

ATTIRE

Competition attire, as described in the [National TSA Dress Code](#) section of this guide, is required for this event.




PROCEDURE

- A. Team members select and research a contemporary biotechnology issue related to the current year's designated topic. Resources may include but are not limited to books, interviews, websites, magazines, professional journals, etc. Team members then prepare their documentation, display, and multimedia presentation according to the event regulations.
- B. Participants check in their entries and submit a LEAP Leadership Resume at the time and place stated in the conference program. No more than two (2) team members set up the display.
- C. Entries are reviewed by evaluators. Neither students nor advisors are present at this time. A semifinalist list in random order is posted.
- D. Two (2) representatives from each semifinalist team, with their multimedia presentation, report to the event area at the time and place stated in the conference program.
- E. Semifinalist team representatives give a brief presentation and answer questions from evaluators. Up to ten (10) minutes will be provided for the presentation; with a few minutes more for questions from evaluators. The LEAP interview will be conducted as part of the semifinalist presentation/interview and will last a maximum of five (5) additional minutes.

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

REGULATIONS

- A. All work must be started and completed during the current school year.
- B. Students must understand the fundamental concepts and principles of the contemporary biotechnology issue the team has selected. Research should focus on significant impacts (opportunities *and* risks) on the environment, economy, and society, as well as any important ethical considerations.

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

- C. Documentation materials (comprising “a portfolio”) are required and should be secured in a [clear front report cover](#). The report cover must include the following single-sided, 8½" x 11" pages, in this order:
1. Title page with the event title, the conference city and state, and the year; one (1) page
 2. Table of contents; pages as needed
 3. Definition and explanation of the problem; one (1) page
 4. An explanation of the chosen solution, and other possible solutions and why they were rejected; maximum three (3) pages
 5. A scenario of possible real-life applications; one (1) page
 6. Supplementary information such as logs, graphs, sketches, drawings, illustrations, photographs, etc.; maximum four (4) pages
 7. A print-out of the accompanying multimedia presentation (printed with three [3] slides per page, recommended); pages as needed
 8. 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 or TSA website); one (1) page
 9. A minimum of three (3) different types of resources; such as books, interviews, professional journals, websites, magazines, etc. All must be cited using Modern Language Association (MLA) format; pages as needed.
 10. A CD or DVD of the team’s multimedia presentation. The CD/ DVD and the multimedia presentation become the property of TSA.
- D. Display guidelines are as follows:
1. The size of the display may not exceed 15" deep x 3' wide x 4' high.
 2. A model or prototype is optional.
 3. AC electricity may not be used. Dry cell or photo-voltaic cells may be used for power, if desired. Any power source used must fit within the maximum display area.
 4. If operating instructions are necessary, they must be clearly displayed.
 5. **No harmful or illegal substances, viruses, live plants, or animals may be used as a part of the display. No potentially dangerous processes may be demonstrated or included as part of the display.**
- E. Each team must be prepared to send two (2) representatives to the semifinalist portion of the event, in which the representatives give a multimedia presentation. The presentation explains the



Don't forget!

Documentation must not include any identifying information beyond the team's conference ID number.



- team's selection of the problem and its solution and is not to exceed ten (10) minutes. Evaluators then ask questions.
- F. The two (2) semifinalist team representatives **MUST** bring a laptop computer for their multimedia presentation. Projection equipment will not be permitted. Only power will be provided.
 - G. LEAP Leadership Resume (see Forms Appendix or TSA website)/Interview — Teams document, in the LEAP leadership resume (see resume template), the leadership skills that the team has developed and demonstrated while working on this event. Semifinalists will respond to questions about the content of their resume as part of their presentation and/or interview. The LEAP Leadership Resume/Interview guidelines and other resources can be found on the [TSA website](#).

EVALUATION

Evaluation is based on the documentation, the display, the LEAP requirements, and the presentation/interview (semifinalists only). Please refer to the official rating form for more information.



STEM INTEGRATION

This event has connections to the STEM standards noted below. Please refer to the STEM integration section of this guide.

Science, Technology, Engineering, Mathematics

TSA AND CAREERS

This competition has connections to one or more of the career areas featured in the TSA AND CAREERS section of this guide. Use *The Career Clusters* chart and the *TSA Competitions and The Career Clusters* grid as resources for information about careers.

CAREERS RELATED TO THIS EVENT

Bioinformatics processor
Food scientist
Microbiologist
Radiographer
Quality control analyst

BIOTECHNOLOGY DESIGN EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Assistants for check-in, two (2)
- C. Evaluators for displays, two (2) or more
- D. Evaluators for semifinalist presentations/interviews, two (2) or more

MATERIALS

- A. Coordinator's packet, containing:
 - 1. Event guidelines, one (1) copy for the coordinator and for each evaluator
 - 2. TSA Event Coordinator Report
 - 3. List of evaluators/assistants
 - 4. Pre-populated flash drives for evaluators
 - 5. Stick-on labels for entries, as needed
 - 6. Results envelope
 - 7. Envelope for LEAP Leadership Resumes
 - 8. LEAP Interview Judging Protocol
- B. Tape measure for evaluators
- C. Stopwatch
- D. Display tables for entries (minimum width 18")
- E. Table and chairs for evaluators and two (2) semifinalist team representatives
- F. A 50' extension cord AND a power strip (for semifinalist interviews)

RESPONSIBILITIES

- A. Upon arrival at the conference, report to the CRC room and check the contents of the coordinator's packet. Review the event guidelines and check to see that enough evaluators/assistants have been scheduled.
- B. Inspect the area in which the displays are being placed for appropriate set-up, including appropriate number and size of tables.

- C. Check in the entries and collect LEAP Leadership Resumes at the time stated in the conference program. Anyone reporting who is not on the coordinator's report may check in only after official notification is received from the CRC. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control. Requirements for attire do NOT apply during check-in.
- D. Place an entry number in the lower right-hand corner of each portfolio and display. Position entries for evaluation and viewing. Secure the entries in the designated area.
- E. One (1) hour before the event is scheduled to begin, meet with evaluators to review time limits, procedures, and regulations. If questions arise that cannot be answered, speak to the event manager before the event begins.
- F. Evaluators independently assess the entries to determine the twelve (12) semifinalists.
- G. For participants who violate the rules, the decision either to deduct twenty percent (20%) of the total possible points or to disqualify the entry must be discussed and verified with the evaluators, event coordinator, and CRC manager.
- H. Submit results to the CRC for posting.
- I. Inspect the area in which the presentations are to take place. Ensure that there is a table and seating for participants and evaluators.
- J. 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 semifinalist presentations begin.
- K. Conduct semifinalist presentations/interviews. Evaluators should be sure to ask questions. The LEAP interview will be conducted as part of the semifinalist presentation/interview and will last a maximum of five (5) additional minutes.
- L. Evaluators determine the ranking of the ten (10) finalists and discuss and break any ties.
- M. Review and submit the finalist results and all items/forms in the results envelope to the CRC room.
- N. If necessary, manage security and the removal of materials from the event area.



Participant/Team ID# _____

BIOTECHNOLOGY DESIGN

2017 & 2018 OFFICIAL RATING FORM

HIGH 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. 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.
- Multimedia presentation is present.
- Completed LEAP Leadership Resume is present.
- ENTRY NOT EVALUATED

Documentation (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 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.			
Portfolio components <small>See Regulation C (X1)</small>	Portfolio is unorganized and/or missing three (3) or more components.	Portfolio has most components, and is generally organized.	Portfolio is missing no components and is clearly well organized.
Definition and explanation of problem and solution(s) <small>(X1)</small>	The definition and explanation of the problem and/or solution(s) to the problem are unclear.	The definition and explanation of the problem and/or solution(s) to the problem are generally clear.	A clear and concise definition and explanation of the problem and solution(s) to the problem are evident.
Research base <small>(X1)</small>	The research is inadequate, and/or very few credible sources are referenced.	The research has been conducted appropriately, with some credible sources cited.	There is a comprehensive research base with credible sources cited.
Supplementary information <small>(X1)</small>	Supplementary information does not help clarify documentation, or it is of little significance to the problem.	Supplementary information is appropriate and adds to the documentation by providing clarity to the problem.	Supplementary information is of excellent quality and clarifies the problem and solution(s).
Quality and effectiveness <small>(X1)</small>	The work is sloppy and disorganized, as if thrown together.	The work is mostly organized and of sufficient quality.	The work is well organized and of exceptional quality.
			SUBTOTAL (50 points)

Record scores in the column spaces below.

Display (40 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points
Communication of problem <small>(X1)</small>	The problem is difficult to understand as communicated and is presented in an illogical manner.	The problem is communicated adequately, and thoughts are somewhat organized and/or concise.	The problem is communicated in an organized, clear, and concise manner.



Display (continued) (40 points)			
Communication of solution (X1)	The solution is difficult to understand as communicated and is presented in an illogical manner.	The solution is communicated adequately, and thoughts are somewhat organized and/or concise.	The solution is communicated in an organized, clear, and concise manner.
Creativity (X1)	The work lacks creativity, with little or no integration of design principles.	Some creative elements are included, and essential design principles and elements are used somewhat effectively.	The work exudes creativity, and essential design principles and elements are integrated.
Aesthetics and artisanship (X1)	The work is unorganized and sloppy, and the display seems to be an afterthought.	The work is organized, with essential design principles given in a logical format.	The work reflects an exemplary use of layout and design principles to logically communicate important data.
			SUBTOTAL (40 points)

Rules violations (a deduction of 20% of the total possible points for the sections above) 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: _____

Semifinalist Presentation/Interview (80 points)			
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 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; 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.
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.
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.
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 and responses to questions.
LEAP Leadership Resume/Interview See Regulation G and instructions on TSA website (X2)	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 LEAP Be. Know. Do. criteria.	The team's efforts are adequately communicated, include some detail, are clear, and/or are generally convincing; identification and/or incorporation of the LEAP Be. Know. Do. criteria is adequate.	The team's efforts are clearly communicated, fully-detailed, and convincing; identification and/or incorporation of the LEAP Be. Know. Do. criteria is excellent.
			SUBTOTAL (80 points)



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

Indicate the rule violated: _____

(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.

Evaluator

Printed name: _____

Signature: _____