

## OVERVIEW

Applying leadership and 21<sup>st</sup> century skills, participants conduct research on a contemporary biotechnology based on an annual theme, document their research, and create an effective interactive display. The information gathered may be student-performed research or a recreation or simulation of research performed by the scientific community. If appropriate, a model or prototype depicting some aspect of the issue may be included. Semifinalists present and are interviewed about their topic. The topic for the current school year will be posted on the [TSA website](#) under *Themes & Problems*.

## ELIGIBILITY

One (1) team per chapter may participate.

## TIME LIMITS

- A. Up to ten (10) minutes for the presentation/interview broken down as follows:
  - 1. one (1) minute for set-up
  - 2. seven (7) minutes for the presentation
  - 3. two (2) minutes to respond to questions from judges

## ATTIRE

TSA competition attire is required for this event.

## PROCEDURE

### PRE-CONFERENCE

- A. Participants review the annual topic found on the [TSA website](#) under *Themes & Problems*.
- B. Participants concentrate their efforts researching a selected contemporary biotechnology issue.
- C. Participants prepare their documentation portfolio, interactive display, and multimedia presentation according to the regulations.

## PRELIMINARY ROUND

- A. No more than two (2) team members report at the time and place stated in the conference program to set up the display.
- B. Entries are evaluated by the judges with neither students nor advisors present based on the following criteria:
  - 1. Judges score the 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) semifinalist teams (in random order) is posted.

## SEMIFINAL ROUND

- A. Up to 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.
- B. Semifinalists team representatives participate in an on-site presentation/interview that lasts a maximum of ten (10) minutes (see Time Limits).
- C. The multimedia presentation must be presented on a student provided laptop during the finalist interview.
- D. 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.

## PRELIMINARY ROUND

- A. Students must understand the fundamental concepts and principles of the contemporary biotechnology topic. Research on a problem within that topic should focus on significant impacts (opportunities and risks) on the environment, economy, and society, as well as any important ethical considerations.

## B. Interactive Display:

1. The total size of the display may not exceed 15" deep x 3' wide x 4' high, including the portfolio.
2. A model or prototype is optional.
3. Power
  - a. AC electricity may not be used.
  - b. Dry cell or photo-voltaic cells may be used for power, if desired.
  - c. 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.
6. The display must be presented as if it were in a children's museum that is geared towards the audience specific to the current year's theme.

## C. Documentation Portfolio:

1. Documentation materials (comprising "a portfolio") are required and must be secured in a [clear front report cover](#) with the following single-sided, 8½" x 11" pages, in this order:
  - a. Title page with the event title, the team identification number, the conference city and state, and the year; one (1) page
  - b. Table of contents; pages as needed
  - c. Definition and explanation of the problem; one (1) page
  - d. An explanation of the chosen solution, and other possible solutions and why they were rejected; maximum three (3) pages
  - e. A scenario of possible real-life applications; one (1) page
  - f. Supplementary information such as logs, graphs, sketches, drawings, illustrations, photographs, etc.; maximum four (4) pages

- g. A print-out of the accompanying multimedia presentation (printed with three [3] slides per page, recommended); pages as needed
- h. Plan of Work log (see Forms Appendix); one (1) page
- i. A minimum of three (3) different types of resources, such as books, interviews, professional journals, websites, magazines, etc. All must be cited using a professional citation style of the competitors choosing. Failure to use a professional citation style will result in a rules violation of 20% (twenty percent). Some examples of professional citation styles include MLA, APA, Chicago, and IEEE; pages as needed.

## SEMIFINAL ROUND

- A. Up to two (2) representatives from each team report at the time and place stated in the conference program with the following computer hardware for the presentation:
  1. a laptop computer
  2. projection equipment is not permitted
  3. laptop computers must operate on battery power
- B. Representatives may reference their display and documentation during the presentation.
- C. The representatives remove their materials from the event area at the conclusion of the presentation/ interview.

## EVALUATION

### PRELIMINARY ROUND

#### Tier 1

- A. The interactive display

#### Tier 2

- B. The portfolio

### SEMIFINAL ROUND

- A. The presentation/interview

Refer to the official rating form for more information.

## STEM INTEGRATION

This event has connections with the STEM (Science, Technology, Engineering, and Mathematics) educational standards.

## 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:

- Bioinformatics processor
- Food scientist
- Microbiologist
- Radiographer
- Quality control analyst

# BIOTECHNOLOGY DESIGN

## 2023 & 2024 OFFICIAL RATING FORM

## HIGH 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 – Documentation Portfolio is present
- ☐ ENTRY NOT EVALUATED

TIER 1 – DISPLAY (80 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
<b>Interactivity</b> (X1)	The display is difficult to understand and interact with, and is presented in an illogical manner; it is not user-friendly.	The display is somewhat organized, but poses some challenges for interaction.	The display is interactive, organized, clear, and user-friendly.	
<b>Explanation of Impacts</b> (X2)	Explanation is missing a description 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 clearly conveys the issue's relevance to environmental, economic, social, and/or ethical considerations.	
<b>Supporting Information</b> (X1)	Support information does not help to clarify the issue, and/or it is of little significance to the issue.	Support information is somewhat appropriate and helps supplement the solution by providing clarity to the issue.	Support information is highly effective and of excellent quality.	
<b>Communication of Issue</b> (X1)	It is difficult to understand the issue being communicated; an illogical explanation is presented.	The issue is communicated and thoughts are somewhat organized.	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 somewhat organized.	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 Artanship</b> (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.	
TIER 1 – DISPLAY SUBTOTAL (80 points)				

TIER 2 – DOCUMENTATION PORTFOLIO (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>Portfolio</b> (X1)	Portfolio is unorganized and/or missing three (3) or more components.	Portfolio has most components and it is somewhat organized.	Portfolio is missing no components and is clearly well organized.	
<b>Definition and Explanation of Issue</b> (X1)	Definition and explanation of the issue are unclear.	Issue is defined and generally explained.	Clear and concise definition and explanation of the issue are evident.	
<b>Scenario and Research Base</b> (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.	
<b>Support Materials</b> (X1)	Support materials do not help clarify the documentation or are of little significance to the issue.	Support materials are appropriate and somewhat supplement documentation by lending some clarity.	Support materials are of excellent quality; if not original, they are cited; support materials clarify the issue.	
<b>Quality and Effectiveness</b> (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.	
<b>TIER 2 – DOCUMENTATION PORTFOLIO 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 (130 points)</b>				

SEMIFINAL PRESENTATION (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, 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.	
<b>Articulation</b> (X1)	Communication of the solution is unclear, unorganized, and or illogical; leadership and/or 21 <sup>st</sup> century skills are not evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 <sup>st</sup> century skills are somewhat evident.	Communication of the solution is clear, concise, and logical; leadership and/or 21 <sup>st</sup> century skills are clearly evident.	
<b>Delivery</b> (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.	

SEMIFINAL PRESENTATION (60 points) – continued				
<b>Knowledge</b> (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.	
<b>Team Participation</b> (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.	
<b>SEMIFINAL PRESENTATION SUBTOTAL (60 points)</b>				
<p>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.</p> <p>Indicate the rule violated: _____</p>				
<b>SEMIFINAL SUBTOTAL (60 points)</b>				
<p>To arrive at the <b>TOTAL</b> score, add any subtotals and subtract rules violation points, as necessary.</p> <p><b>TOTAL (190 points)</b></p>				

Comments:

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

**JUDGE**

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

# BIOTECHNOLOGY DESIGN

## EVENT COORDINATOR INSTRUCTIONS

### PERSONNEL

- A. Event coordinator
- B. Assistants for check-in, two (2)
- C. Judges:
  - 1. Preliminary round, two (2) or more
  - 2. Semifinal round, 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 entries, as needed
  - 5. Results envelope
- B. Tape measure for judges
- C. Stopwatch
- D. Display tables for entries (minimum width 18")
- E. Table and chairs for judges and two (2) semifinalist team representatives
- F. A 50' extension cord AND a power strip (for semifinalist interviews)

### 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, tables, chairs, etc. Notify the event manager of any potential problems.

- E. 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

- A. Check in the entries at the time and place stated in the conference program.
- B. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
- C. In order to compete, participants must be on the entry list or must have CRC approval.
- D. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- E. Each entry must include the team's identification number in the upper right-hand corner of the entry.
- F. Instruct participants to position displays for viewing.
- G. Secure the entries in the designated area.

#### PRELIMINARY ROUND

- A. Judges independently assess the entries:
  - 1. The initial round of judging scores the interactive display entries to determine the top twenty-four (24) participants.
  - 2. The second round of judging scores the portfolios 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 CRC manager to determine either:
  - 1. To deduct twenty percent (20%) of the total possible points or
  - 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.
- D. Submit the semifinalist results and all related forms in the results envelope to the CRC room.
- E. Create and post a sign-up sheet.

### SEMIFINAL ROUND

- A. Semifinalists report at the time and place stated in the conference program to sign-up for a presentation/interview time.
- B. Semifinalists report at the assigned time and place for the presentation/interview.
- C. Manage the semifinalist presentations/interviews.
- D. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- E. Judges determine the ten (10) finalists and discuss and break any ties.
- F. Submit the finalist results and all related forms in the results envelope to the CRC room.
- G. If necessary, manage security and the removal of materials from the event area.