

SCIENTIFIC AND TECHNICAL VISUALIZATION (SCIVIS)



OVERVIEW

Scientific and Technical Visualization (SciVis) is the representation of complex scientific and/or technical concepts in a visual form. Applying leadership and 21st century skills, participants use either 2D or 3D computer graphics tools and design processes to communicate, inform, analyze, and/or illustrate a STEM topic, idea, subject, or concept.

ELIGIBILITY

One (1) team per chapter may participate; individual entries are permitted.

TIME LIMITS

PRELIMINARY ROUND

- A. The visualization must be two to three (2-3) minutes in length.
- B. There is a five (5)-point deduction for each fifteen (15) seconds under two (2) minutes or over four (4) minutes.
- C. The visualization time length is calculated from the start of the first image or sound to the end of the last image or sound.

SEMIFINAL ROUND

- A. Up to ten (10) minutes are allowed for the interview.

ATTIRE

TSA competition attire is required for this event.

PROCEDURE

PRE-CONFERENCE

- A. Participants concentrate their efforts on creating a 2D or 3D computer graphic that illustrates a STEM topic.

PRELIMINARY ROUND

- A. Participants report at the time and place stated in the conference program to check in their entries.
- B. Entries are reviewed by judges with neither students nor advisors present.
 - 1. Judges review and score the Visualization 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) semifinalist teams.
- C. A list of twelve (12) semifinalists (in random order) is posted.

SEMIFINAL ROUND

- A. No more than two (2) semifinalist team representatives report at the time and place stated in the conference program to sign up for an interview time.
- B. No more than two (2) representatives from each semifinalist team report at the assigned time and place for the interview.
- C. Each semifinalist team answers questions about their portfolio from the judges, discussing the purpose, value, research, and design process.
- D. The top ten (10) finalists are announced at the awards ceremony.

REGULATIONS AND REQUIREMENTS

Students will work to develop their leadership and 21st 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. All entries must be the original work of the participant or team.

1. Where applicable, all ideas, text, images, and sound from other sources must be cited.
2. If copyrighted material is used, proper written permission must be included.
3. Failure to follow this procedure results in disqualification.

B. All entries become the property of TSA and will not be returned after judging.

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. USB flash drive (containing the visualization) in a secure holder or sealed sleeve at the front of the portfolio.
 - b. Title page with the event title, the conference city and state, and the year; one (1) page
 - c. Table of contents; pages as needed
 - d. Purpose of visualization, including the intended audience; one (1) page
 - e. Hand-sketched storyboard that documents the flow and progression of the visualization with written notes; special effects, audio cues, dialogue, transitions, and scene duration should be incorporated into the storyboard; pages as needed
 - f. List of references that includes sources for materials, copyrighted and otherwise; pages as needed. (The term “Fair Use” and similar terms are not acceptable citations when creating the list of references.)
 - g. Permission letters for copyrighted material; pages as needed
 - h. List of software and hardware used in the development of the visualization; one (1) page

i. Plan of Work Log (see Forms Appendix or [TSA website](#)); pages as needed

j. Completed and signed Student Copyright Checklist (see Forms Appendix or [TSA website](#)); one (1) page

D. Visualization:

1. Visualizations must be turned in on a USB flash drive in MPEG format suitable for viewing with a VLC Player utilizing a Microsoft Windows operating system.
2. The following are NOT permitted:
 - a. PowerPoint presentation or PowerPoint slide show are not acceptable formats for this event.
 - b. Absolutely no purchased content may be used in any part of the visualization. (Purchased content includes, but is not limited to, texture, models, and royalty free music.)
 - c. Web applications that allow purchasing of elements (i.e.: Animaker and Powtoons) are not permitted.
 - d. Live action video, including “whiteboard” style entries.
3. Suggested software includes: Flash, Maya, 3DS Max, Adobe Animate, etc.
 - a. Stop motion animation (both 2D and 3D) are acceptable.
4. Each visualization must advance automatically once it has been opened and started by the judges. A splash screen is acceptable, provided the “PLAY” command is easily visible.
5. All work must be included in the portfolio and on a USB flash drive.
6. The visualization is not to be under two (2) or over three (3) minutes in length.
7. There will be a five (5)-point deduction for each fifteen (15) seconds under the minimum time or for each fifteen (15) seconds over the maximum time.
8. Sound may accompany the visualization.

EVALUATION

PRELIMINARY ROUND

- A. The portfolio
- B. The visualization

SEMIFINAL ROUND

- A. The interview

Refer to the official rating form for more information

STEM INTEGRATION

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

LEADERSHIP AND 21ST CENTURY SKILLS DEVELOPMENT

This event provides opportunity for students to build and develop leadership and 21st 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:

- Computer animator
- Game designer
- Instructional technologist
- Software engineer

SCIENTIFIC AND TECHNICAL VISUALIZATION (SCIVIS)

2021 & 2022 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.

- ☐ The portfolio is present
- ☐ The USB flash drive is present
- ☐ The visualization is playable
- ☐ Student Copyright Checklist is present
- ☐ ENTRY NOT EVALUATED

VISUALIZATION (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	
Communication of Visualization (X2)	It is difficult to understand the concept being communicated; an illogical explanation is presented.	The concept is communicated generally adequately.	The concept is communicated in an organized, clear, and concise manner.	
Creativity (X2)	The visualization lacks creativity; no, or very few, design principles are integrated in the visualization.	Some elements of creativity are expressed, with most design principles integrated.	The visualization exudes creativity; essential design principles and elements are integrated.	
Aesthetics and Artanship (X1)	Unorganized, sloppy work is evident; the visualization seems to be an afterthought and/or thrown together.	A largely organized presentation of layout and design principles is evident.	An exemplary use of layout and design principles to logically communicate important data is evident.	
Graphical Representations (X2)	Graphical representations do not help to clarify visualization, or they are of little significance to the project.	Graphical representations are appropriate and help supplement the visualization by providing clarity to the project.	Graphical representations are of excellent quality; and clarify abstract concepts.	
Originality (X1)	The visualization lacks imagination, originality, and artistic detail.	The visualization is somewhat effective, inventive, and inspiring.	The visualization is inspiring, inventive, resourceful, and motivating.	
VISUALIZATION 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: _____				

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	
Portfolio Components (X1)	The portfolio is unorganized and/or missing three (3) or more components.	The portfolio has most components and is adequately organized.	All components are present, and content and organization are clearly evident.	
Purpose (X1)	The purpose of the visualization idea generation is unclear.	The purpose is explained appropriately and adequately.	The purpose of the visualization is clear and concisely written, and compelling.	
Storyboard (X2)	The storyboard is sloppy, seems to have been thrown together after the creation of the visualization, and/or it does not correlate with the visualization.	The storyboard is drawn appropriately and largely correlates with the completed visualization.	The storyboard is of exceptional aesthetic and artistic quality and clearly correlates with the visualization, including timings.	
Plan of Work Log (X1)	The Plan of Work Log lacks major elements of documentation.	The Plan of Work Log is somewhat completed and generally reflects the time and work necessary for the project.	The Plan of Work Log completely and accurately reflects the time and work necessary for the project and captures collaborative work with edits and changes noted.	
DOCUMENTATION PORTFOLIO SUBTOTAL (50 points)				

TIME DEDUCTIONS	
There will be a five (5) point deduction for each fifteen (15) seconds under the minimum time or each fifteen (15) seconds over the maximum time allowed for the visualization.	
Total time for visualization	
Visualization time deduction	
TOTAL TIME DEDUCTION	

PRELIMINARY SUBTOTAL (130 points)	
--	--

SEMIFINAL INTERVIEW (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	
Organization (X1)	The team/individual seems unprepared and unorganized for the interview.	The team/individual is somewhat prepared and organized in its interview.	The team is well-prepared and any questions asked by judges are answered concisely.	
Knowledge (X2)	The team/individual seems to have little understanding of its chosen topic.	The team/individual has a generalized understanding of its chosen topic.	There is clear evidence of a thorough understanding of the chosen topic.	

SEMIFINAL INTERVIEW (50 points) – continued				
Articulation (X1)	Communication of the solution is unclear, unorganized, and/or illogical; leadership and/or 21 st century skills are not evident.	Communication of the solution is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the solution is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Delivery (X1)	The team/individual is verbose and/or uncertain in the interview; posture, gestures, and lack of eye contact diminish the delivery.	The team/individual is somewhat well-spoken and clear in the interview; posture gestures, and eye contact result in an acceptable delivery.	The team/individual is well-spoken and distinct in the interview; posture, gestures, and eye contact result in a polished, natural, and effective delivery.	
SEMIFINAL INTERVIEW SUBTOTAL (50 points)				
Time violation (a deduction of five (5) points total will be incurred for exceeding the semifinalist interview time limit). Record the deduction in the space to the right.				
SEMIFINAL SUBTOTAL (50 points)				
To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary. TOTAL (180 points)				

Comments:

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

JUDGE

Printed name: _____ Signature: _____

SCIENTIFIC AND TECHNICAL VISUALIZATION (SCIVIS)

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Assistant for check-in, one (1)
- C. Judges:
 - 1. Preliminary round, two (2) or more for initial review of entries. If more than 20 entries, provide 2 additional evaluators to conduct heats.
 - 2. Semifinal round, two (2) or more for interviews

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 judge/assistants
 - 4. Pre-populated flash drives for judges, if applicable
 - 5. Results envelope
- B. Tables for entries
- C. Tables and chairs for initial judges
- D. Tables and chairs for semifinalist judges and participants
- E. Extension cords and power-bars with protection for judges, as needed

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 or room in which the event is to be held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

- E. At least one (1) hour before the event is scheduled to begin, meet with judges/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. Participants check in:
 - 1. The entry on a USB thumb drive
 - 2. The documentation portfolio
- 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 approval of the CRC.
- D. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- E. Place a team identification number stick-on label in the lower right-hand corner of each portfolio.
- F. Secure the entries in the designated area.

PRELIMINARY ROUND

- A. The number of judges depends upon the number of entries. Heats of 20 entries may be used at the coordinator's discretion.
- B. Judges independently assess the entries using the following procedure:
 - 1. Judges review and score the Visualization criteria to determine the top twenty-four (24) preliminary contestants, which will not be published.
 - 2. Judges score the Documentation Portfolio criteria of those top twenty-four (24) contestants to determine the top twelve (12) semifinalist teams.

- C. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and a CRC manager to determine either:
 - 1. To deduct twenty percent (20%) of the total possible points in this round or
 - 2. To disqualify the entryThe event coordinator, judges, and CRC manager must initial either of these actions on the rating form.
- D. Judges determine the twelve (12) semifinalist teams.
- E. Submit semifinalist results to the CRC for posting.
- F. Create an interview sign-up sheet.

SEMIFINAL ROUND

- A. Inspect the area in which the interviews are to take place. Ensure that there is a table and seating for the interviews.
- B. At least one (1) hour before the event is scheduled to begin, meet with judges/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.
- C. Semifinalists report to the event area at the time and place stated in the conference program to sign up for an interview time.
- D. Manage the interview process.
- E. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
- F. Judges determine the ten (10) finalists and discuss and break any ties.
- G. Submit the finalist results and all related forms in the results envelope to the CRC room.
- H. Collect all USB flash drives and portfolios and give them to the event manager.
- I. Manage security and removal of all materials from the area.