

OVERVIEW

Animatronics refers to a robotic device that emulates a human or an animal, or brings an inanimate object “to life.” Applying leadership and 21st century skills, teams produce an animatronics device complete with an appropriate display. The animatronics device must use control technology in its performance and fulfill the requirements of the theme to communicate, entertain, inform, demonstrate and/or illustrate a topic, idea, subject, or concept. Sound, lights, and surrounding environment are to accompany the device. The annual design problem is posted on the [TSA website](#) under Competitions/Themes and Problems.

ELIGIBILITY

One (1) team per chapter may participate.

TIME LIMITS

- A. Up to five (5) minutes to set up.
- B. Up to nine (9) minutes for the presentation.
 - 1. The presentation time begins when students present background information about the project and must conclude on or before the nine (9)-minute time limit.
 - 2. Five (5) points will be deducted for every thirty (30) seconds over the time limit.
 - 3. The judges’ interview is not considered part of the presentation time.

ATTIRE

TSA competition attire is required for this event.

PROCEDURE

PRE-CONFERENCE

- A. Participants review the design problem on the [TSA website](#) under Competitions/Themes and Problems.
- B. Participants concentrate their efforts on designing an animatronics device that uses control technology.
- C. Participants create a display.

ON-SITE PRESENTATION/INTERVIEW

- A. Participants report to the time and place stated in the conference program to:
 - 1. Check in
 - 2. Sign up for a presentation/interview timeNo animatronics devices are submitted during this time.
- B. Participants report for the presentation/interview at the selected demonstration time with the animatronics device and display. Only three (3) team members are allowed to set up equipment, present the project, and participate in the event-specific interview.
- C. If the manager/coordinator of the event deems it necessary to run the event in heats, then the finalists are determined from each heat.
- D. Judges independently assess the entries.
- E. A list of ten (10) finalist teams is 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.

- A. The display may not exceed 15" deep x 3' wide x 4' high. The device may extend beyond the dimensions of the display during the demonstration.
- B. The exterior shell or skin is required. It must be removable in order to show the judges the internal components of the project.
- C. The animatronic device must have at least three (3) separate movements that must include:
 - 1. Fluid power to aid in the movement of the animatronics device. If no fluid power is used, a ten (10)-point deduction will be incurred.
 - 2. Sound, lights, and sensors in the project model.
 - 3. Gearing systems, linkages, and/or cabling systems, etc., to aid in the movement of the device.

- D. Control technology must be used during the performance.
- E. A wet cell battery may not be used in the animatronics device.
- F. The animatronics device may use AC power, but the team will only have access to an AC outlet during the demonstration/presentation.
- G. **Should the device suggest anything that is inappropriate by language, sound, or movement, immediate disqualification will result.**
- H. A team that fails to appear for its demonstration forfeits evaluation.

EVALUATION

- A. The device
- B. The presentation/interview

Refer to the official rating form for more information.

NOTES

Learn more about animatronics by visiting the following:

www.roborobotics.com/Animatronics/Animatronics.html

www.animalmakers.com

www.garnerholt.com

www.dreamation.com/Animatronics.htm

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:

- Amusement park robotics maintenance engineer
- Electronics technician
- Film industry special effects engineer
- Industrial designer
- Toy developer

ANIMATRONICS

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.

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- ☐ Skins/shells are removable
- ☐ Interior skeleton and mechanism are accessible for inspection
- ☐ ENTRY NOT EVALUATED

DEMONSTRATION PRESENTATION (30 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 and Knowledge (X1)	Team seems unprepared and unorganized for the presentation/interview, with an illogical explanation of the project; team members seem to have little understanding of the concepts in their project; vague interview answers are provided.	Team is prepared for the interview and is somewhat organized in its presentation to judges; team's presentation is somewhat logical and/or clear; team members have a general understanding of the concepts discussed and answer questions adequately.	Team's presentation/interview with judges is well organized; the interview is concise and logical, with a clear explanation of the development of the project; evidence is clear that team members have a thorough understanding of the concepts discussed; they answer questions thoroughly.	
Articulation (X1)	Communication of the design process is unclear, unorganized, and/or illogical; leadership and/or 21 st century skills are not evident.	Communication of the design process is somewhat logical and clear; leadership and/or 21 st century skills are somewhat evident.	Communication of the design process is clear, concise, and logical; leadership and/or 21 st century skills are clearly evident.	
Team Participation (X1)	Only one person in the group communicates with judges; there is little or no participation from other team members.	Team members all participate to some extent and seem to understand the concepts.	Team members seem to fully understand the concepts and share an equal role in the interview.	
DEMONSTRATION INTERVIEW SUBTOTAL (30 points)				

MODEL APPEARANCE (30 points)				Record scores in the column spaces below.
CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Creativity, Aesthetics and Artisanry, Originality (X3)	Model lacks creativity; very few or no design principles are integrated in the model; work is unorganized and/or sloppy; model seems to be an afterthought and/or thrown together; model lacks imagination, originality, and artistic detail.	Some elements of creativity are evident, and most essential design principles are included and used somewhat effectively; some layout and design principles are integrated into the model, and aesthetics are adequate; model is somewhat innovative.	Model exudes creativity; essential design principles and elements are integrated; there is exemplary use of layout and design principles; artistic and aesthetic values are incorporated; model is inspiring, inventive, and resourceful.	
MODEL APPEARANCE SUBTOTAL (30 points)				

Record scores in the column spaces below.

MODEL FUNCTION (60 points)			
Skin and skeletal function: There is no point value for the skin and skeletal function of the animatronics model. The model's skin must be removable in order to reveal skeletal function and mechanics located beneath the skin. If the skin is not removable then the entry will not be evaluated.			
CRITERIA	Minimal performance	Adequate performance	Exemplary performance
	1-4 points	5-8 points	9-10 points
Sound Inclusion (X1)	There is little or no sound included, or the design suggests that the inclusion of sound was an afterthought to the model.	Sound is included, and it somewhat contributes to the overall function of the model.	The inclusion of sound is creative and effectively contributes to the design and performance of the model.
Light Inclusion (X1)	Light is minimal, or the design suggests that the inclusion of lights was an afterthought to the model.	Light is included, and it somewhat contributes to the overall function of the model.	The inclusion of a light creatively and effectively contributes to the model's design and performance.
Sensor Inclusion (X1)	Sensors are included minimally, or the design suggests that the inclusion of sensors was an afterthought to the model.	Sensors are included, and they somewhat contribute to the overall function of the model.	The inclusion of sensors (and the interactivity that sensors allow) in the model is creative and effectively contributes to its design and performance.
Control Technology (X1)	Little control technology is used during the performance.	Some basic control technology is used during the performance.	Advanced control technology is used during the performance; the model is fully autonomous.
Fluid Power System Inclusion (X1)	A fluid power system is included, but it functions inadequately or not at all.	A fluid power system is included, and it contributes somewhat to the overall function of the model.	The inclusion of a fluid power system(s) and the fluidity of movement that this system(s) provides in an animatronics model creatively and effectively contribute to the model's design and performance.
Use of Gears, Linkages, Cabling, etc. (X1)	The use of gears, linkages, cabling, etc. is minimally apparent or improperly incorporated into the model; the team shows little understanding of how to properly use these systems in the model.	Most gears, linkages, cabling systems, etc. are incorporated and used properly in the model; there is evidence of an adequate understanding of the systems.	Efficient and varied use of gears, linkages, cabling systems, etc. is apparent and properly incorporated in the model; there is evidence of a complete understanding of these systems.
MODEL FUNCTION SUBTOTAL (60 points)			

TIME DEDUCTIONS

A five-(5) point deduction will be incurred for every thirty (30)-second interval over the allotted time. Multiply the number of intervals by five (5) and record the total deduction in the column to the right.

of intervals X 5 = _____ (total deduction)

Rules violations (a deduction of 20% of the total possible points in 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: _____

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

TOTAL (120 points)

Comments:

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

JUDGE

Printed name: _____ Signature: _____

ANIMATRONICS

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. Assistant for check-in, one (1)
- C. Timekeeper, one (1)
- D. Judges, 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. Tables for presentation
- C. Table and chairs for judges

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 judges/assistants 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 and review the time limits, procedures, regulations, evaluation, and all other details related to the event. If questions arise that cannot be answered, speak to the CRC event manager before the event begins.

CHECK-IN

- A. Check in participants at the time and place stated in the conference program. During check-in, participants only sign up for a presentation time and do not submit their entry.
- B. As participants sign up for a presentation/interview time, notify them that they are to report fifteen (15) minutes prior to their scheduled time.
- C. Late participants and/or entries are considered on a case-by-case basis and only when lateness is caused by events beyond the participant's control.
- D. In order to compete, participants must be on the entry list or must have approval from the CRC.

ON-SITE PRESENTATION/INTERVIEW

- A. Oversee the presentation/interviews.
- 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 in this round 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 ten (10) finalists and discuss and break any ties.
- D. Review and submit the finalist results and all related forms in the results envelope to the CRC room.
- E. If necessary, manage security and the removal of materials from the area.