OVERVIEW

Animatronics refers to a robotic device that emulates a human or an animal, or brings an inanimate object "to life." Disney and Six Flags theme parks use animatronics in some of their attractions. Participants will produce an animatronics device complete with an appropriate display. The animatronics device must use control technology in its performance. The device must not suggest anything that is inappropriate by language, sound, or movements. Evaluation is based on performance, device artisanship, and documentation of design efforts.

PURPOSE

Students must work as part of a team to demonstrate knowledge of mechanical and control systems by designing, fabricating, and controlling an animatronics device that will communicate, entertain, inform, demonstrate and/or illustrate a topic, idea, subject, or concept. Sound, lights, and surrounding environment are to accompany the device.

ELIGIBILITY

A. One (1) team entry per chapter is permitted.

B. There is a limit of three (3) representatives per team for the presentation/interview.

TIME LIMITS

A. Entries must be started and completed during the current school year.

B. Participants are given five (5) minutes to set up their presentation equipment prior to their presentation.

C. The presentation must last no longer than five (5) minutes.

D. The presentation time begins when students give background information about the project from their portfolio and must conclude on or before the five (5) minute time limit. Five (5) points will be deducted for exceeding the time limit. The judges' interview is not considered part of the presentation time.

ATTIRE

Competition attire, as described in National TSA Dress Code (www.tsaweb.org/Dress-Code), is required for this event.

PROCEDURE

A. Participants will check in their entry (portfolio and animatronics device) at the time and place stated in the conference program.

B. At check-in, each team will select a presentation/interview time from the available times posted. When selecting a demonstration time, teams should avoid conflicts with other events for which team members are registered.

C. Participants report for the presentation/interview at the selected demonstration time with the animatronics device, display, and portfolio. Only participants are allowed to set up equipment and present the project.

D. No more than two (2) team members pick up their entry from the display area at the time and place stated in the conference program.

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 and Clarification. When students participate in any TSA competitive event, they are responsible for knowing of updates, changes, or clarification related to that event.

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

REGULATIONS

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 animatronics device must have three (3) or more separate movements. A skin is required. The skin must be removable in order to show the judges the skeleton and mechanics of the project. Fluid power, gearing systems, linkages, and/or cabling systems, etc. should be incorporated to aid in the movement of the device.

C. Sound, lights, and sensors must be incorporated in the project model.

D. Control technology must be used during the performance.

E. The use of fluid power must be incorporated to aid in the movement of the animatronics device. If no fluid power is used, the animatronics device will lose ten (10) points. To be awarded points, the model must demonstrate movement provided by fluid power.

F. 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, the year, and the team/chapter ID number (identification numbers are issued on site and therefore may be handwritten); one (1) page
2. Table of contents; pages as needed
3. Purpose of the animatronics device; one (1) page
4. Design and test log, including date, test duration, problems, redesigns, and other comments; maximum five (5) pages
5. List of resources that includes materials, parts, software, hardware, and sources of information used in the development of the project; one (1) page
6. Plan of Work log that indicates preparation for the event, as noted by date, task, time involved, team member responsible, and comments (see Plan of Work log); one (1) page
7. Permission letters for copyrighted material, if incorporated; pages as needed

G. The animatronics device may not contain a wet cell battery.

H. The animatronics device may use AC power, but the participant will only have access to an AC outlet during the demonstration/ presentation.

I. Should the device suggest anything that is inappropriate by language, sound, or movement, immediate disqualification will result.

J. A team that fails to appear for its demonstration forfeits judging.

EVALUATION

Teams are evaluated on their written work, model function, programming structure, and efficiency. Refer to the official rating form for detailed information.

NOTES

You can learn more about animatronics by visiting the following:

www.animatronica.co.uk/default.asp
www.animalmakers.com
www.garnerholt.com
www.dreamation.com/Animatronics.htm

STEM INTEGRATION

This event aligns with the STEM educational standards noted below. Please refer to the STEM Integration section of this guide for more information.

Science, Technology, Engineering, Mathematics

COMMON CORE STATE STANDARDS (CCSS) INTEGRATION

Please refer to the Common Core State Standards (CCSS) Integration section of this guide for more information.

PRIMARY LEADERSHIP SKILLS

Leadership skills promoted in this event:

- CRITICAL THINKING — Students use prior knowledge to accomplish a task. Suggested leadership lessons: *And the Answer Is* and *Figure it Out*
- PROBLEM SOLVING — Students work out any animation design flaws. Suggested leadership lessons: *Finding the Right Way* and *Problem Solving Steps*
- TEAMWORK — Students delegate tasks based on individual skills. Suggested leadership lessons: *Effective Meetings* and *Restaurant Business Plan*

Additional leadership skills promoted in this event: communication, creative thinking, organization, self-esteem

TSA AND CAREERS

This competition connects to one or more of the career areas featured in the TSA AND CAREERS section of this guide. Use *The 16 Career Clusters* chart and the *TSA Competitions and The 16 Career Clusters* grid as resources for information about careers.

CAREERS RELATED TO THIS EVENT

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

TECHNOLOGY STUDENT ASSOCIATION
PLAN OF WORK

Date	Task	Time involved	Team member responsible	Comments
1				
2				
3				
4				
5				
6				

Advisor signature _____

ANIMATRONICS
EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

A. Event coordinator

B. Assistant for check-in and portfolio collection, one (1)

C. Evaluators, two (2) or more for the portfolio evaluation and two (2) or more for the presentation/interview (preferably same two [2])

MATERIALS

A. Coordinator's notebook, containing:

1. Event guidelines, one (1) copy for the coordinator and for each evaluator
2. Official rating forms, one (1) set for each event evaluator
3. List of entries, with finalist report
4. List of evaluators/assistants
5. Extension cord (25' minimum length)
6. One (1) stopwatch
7. Pens for evaluators
8. Notepads for evaluators
9. Calculators, one (1) for each event evaluator
10. Results envelope

B. Tables for presentation

C. Table and chairs for evaluators

☑ Be sure to seal the results in the envelope provided and return them to the CRC room.

RESPONSIBILITIES

A. Upon arrival at the conference, report to the CRC room and check the contents of the coordinator's notebook. Review the event guidelines and check to see that enough evaluators/assistants have been scheduled.

B. Inspect the area(s) in which the event is being held for appropriate set-up, including room size, chairs, tables, outlets, etc. Notify the event manager of any potential problems.

C. At least one (1) hour before the event is to begin, meet with your evaluators and check-in personnel to review time limits, procedures, and regulations. If questions arise that cannot be answered, speak to the CRC event manager before the event begins.

D. Check in all entries at the time stated in the conference program. The coordinator should have each team sign up for a specific time for its presentation/interview (within the time frame designated for the event). Once each team has scheduled a presentation/interview time, make sure that the participants understand that they are to return fifteen (15) minutes before their scheduled presentation time.

E. At a designated time, evaluators individually evaluate and score entry portfolios prior to presentations.

F. Notify the event manager immediately of any team reporting for the presentation portion of the event that is not on the entry list. A team not on the entry list is permitted to participate, but the coordinator MUST confirm the team's eligibility. If it is found that the team is not registered for the event, the team is disqualified.

G. Evaluators independently assess a team's presentation/interview. Evaluators may take notes, but evaluation occurs only after all team members have left the event room.

H. For participants who violate the rules, the decision either to deduct 20% of the total possible points or to disqualify the entry must be discussed and verified with the evaluators, event coordinator, and a CRC manager; all must initial either of these actions on the rating form.

I. Complete and submit the finalist report and all related forms in the results envelope to the CRC room.

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

Participant/Team ID# _____

ANIMATRONICS

2015 & 2016 OFFICIAL RATING FORM — HIGH SCHOOL

Documentation (30 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	Record scores in the column spaces below.
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 far 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.)				
Portfolio components See Regulation F (X1)	Portfolio is unorganized and/or is missing three or more components.	Portfolio is missing two components, and/or it is loosely organized.	Only one or no components are missing in the portfolio, and content and organization are clearly evident.	
Purpose and description (X1)	Purpose and description of the animatronics design idea are unclear, and/or major grammatical errors are evident.	Purpose and description are explained appropriately, but some grammatical errors are evident, and/or the writing is not concise.	Purpose and description of the animatronics design are clear and concisely written; presentation interests the reader; few grammar mistakes are evident.	
Design and test log (X1)	Design and test log is illogical and/or shows no evidence of growth from the initial design to the final solution; log is unorganized and/or missing two or more of the following components: date of test(s), test duration, and/or problems/redesigns.	All or most components of the design and test log are incorporated; however, only some evidence is shown that the log was used to shape the design of the animatronics device, and/or the log is not completely neat, organized, and concise.	The log is neat, organized, and concise; it includes all components and shows evidence that it was used to shape the animatronics design from conception through redesign(s) and then to completion.	
			SUBTOTAL (30 points)	

Presentation/interview (50 points)

CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
Organization (X1)	Team seems unprepared for the interview and is unorganized; team's presentation is full of illogical thoughts that lack understanding and clarity.	Team is prepared for the interview and is somewhat organized in its presentation to judges; team's presentation thesis is, for the most part, logical and/or clear.	Team's presentation and interview with judges are well organized; the interview is concise and logical, with a clear explanation of the thesis and pertinent issues.	
Knowledge (X1)	Team members seem to have little understanding of the concepts in their project; vague interview answers are provided.	Team members have a generalized understanding of the concepts discussed and answer questions well.	Evidence is clear that team members have a thorough understanding of the concepts discussed; they answer questions thoroughly.	
Articulation (X1)	The presentation and interview provide an unclear, unorganized, and or illogical description of the project.	The presentation and interview offer a somewhat logical and easy-to-understand project description.	The presentation provide a clear, concise, and easy-to-follow description of the project.	

ANIMATRONICS (continued)				
Presentation/interview (50 points) (continued)				
Delivery (X1)	Participants are verbose, illogical in presenting, and use many "uhs, ums, hmms," etc.	Participants are logical and fairly well spoken, with little use of "uhs, ums, hmms," etc.	Participants are well spoken, distinct, and clear throughout the presentation/interview.	
Team participation (X1)	Only one person in the group communicates with judges; there is little or no participation from other team members.	Team members 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.	
			SUBTOTAL (50 points)	
Model Appearance (30 points)				
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 points	
Creativity (X1)	Model lacks creativity; very few or no design principles are integrated in the model.	Some elements of creativity are evident, but essential design principles are missing or are not used effectively.	Model exudes creativity; essential design principles and elements are integrated.	
Aesthetics and artisanship (X1)	Work is unorganized and/ or sloppy; model seems to be an afterthought and/or thrown together.	Some layout and design principles are integrated into the model, and aesthetics are adequate.	There is exemplary use of layout and design principles; artistic and aesthetic values are incorporated.	
Originality (X1)	Model lacks imagination, originality, and artistic detail.	Model is somewhat innovative.	Model is inspiring, inventive, resourceful, and very motivating.	
			SUBTOTAL (30 points)	
Model Function (70 points possible)				
CRITERIA	Minimal performance 1-4 points	Adequate performance 5-8 points	Exemplary performance 9-10 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 a rules violation will occur.			
Movements (X1)	The model has no movements or only one separate movement.	The model has some movements, but not all are separate, and/or the mechanics of the movements may limit range of motion.	All movements are included; an exemplary use of movement mechanics permits a different range of motion for each movement.	
Sound inclusion (X1)	There is no sound included, or the design suggests that the inclusion of sound was an afterthought to the model.	Sound is included, but it does not contribute fully 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)	No light is included, or the design suggests that the inclusion of lights was an afterthought to the model.	Light is included, but it does not fully contribute to the overall function of the model.	The inclusion of light is creative and effectively contributes to the design and performance of the animatronics model.	
Sensor inclusion (X1)	No sensors are included, or the design suggests that the inclusion of sensors was an afterthought to the model.	Sensors are included, but they do not fully contribute to the overall function of the model.	The inclusion of sensors (and the interactivity that sensors allow for) in the model is creative and effectively contributes to its design and performance.	
Control technology (X1)	Little or no 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.	

ANIMATRONICS (continued)				
Model Function (70 points possible) (continued)				
Fluid power system inclusion (X1)	A fluid power system is included, but it doesn't function.	A fluid power system is included, but it does not contribute greatly to the overall function of the model.	The inclusion of fluid power system(s) and the fluidity of movement that these systems provide in an animatronics model are creative and effectively contribute to its design and performance.	
Use of gears, linkages, cabling, etc. (X1)	The use of gears, linkages, cabling, etc. is not apparent or is 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; some systems should be redesigned for more efficient use of materials.	Efficient and varied use of gears, linkages, cabling systems, etc. is apparent and properly used in the model; there is evidence of a complete understanding of these systems.	
			SUBTOTAL (70 points)	

Rules violations (a deduction of 20% of the total possible points) must be initialed by the evaluator, coordinator, and manager of the event. Record the deduction in the space to the far right. Indicate the rule violated: _____	
Time violation (a deduction of five points total will be incurred for exceeding the five-minute presentation time limit). Record the deduction in the space to the right.	
(To arrive at TOTAL score, add any subtotals and subtract rules violation points, as necessary. Check your math twice!) **TOTAL (180 points)**	

Comments:

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

Evaluator

Printed name: _____ Signature: _____