

MASS PRODUCTION



OVERVIEW

Participants manufacture a marketable product related to the current year's theme, noted on the [TSA website](#) under Competitions/Themes and Problems. Teams will create three identical copies to demonstrate their skill and knowledge pertaining to the mass production process, however, the official entry is comprised of a documentation portfolio and only one (1) prototype.

ELIGIBILITY

One (1) team of at least two (2) individuals per chapter may participate. Two (2) members of a team must be present at a semifinalist presentation/interview.

TIME LIMITS

The semifinalist presentation may be up to five (5) minutes in length, and the interview will be no more than five (5) minutes in length.

LEAP

A team LEAP Response is required for this event and must be submitted at event check-in.

ATTIRE

TSA competition attire is required.

PROCEDURE

PRE-CONFERENCE

During the school year, participants should follow these steps in preparing their entry:

1. Research designs for products related to the current year's theme.
2. Create working drawings.
3. Develop a prototype that can be replicated for three [3] identical copies of the product. Only the prototype will be submitted on-site as part of the entry.
4. Devise production plan flow chart(s).
5. Develop a personnel plan with assigned responsibilities.

6. Tool up for production.
7. Conduct a trial run and evaluate process effectiveness and efficiency.
8. Manufacture several products using line production techniques.
9. Be sure to include images and documentation of the additional copies of the prototype as part of the portfolio submission.
10. Document the team project with a photo time line.

PRELIMINARY ROUND

1. Participants check-in the following at the time and place stated in the conference program:
 - a. The documentation portfolio
 - b. The prototype
 - c. A hard copy of the LEAP Response with no report cover, separated from the portfolio
2. No more than two (2) team members may turn in an entry.
3. Entries are independently reviewed by judges with neither students nor advisors present.
4. A list of twelve (12) semifinalist teams (in random order) will be posted.

SEMIFINAL ROUND

1. Representatives from each semifinalist team report to the event room at the time and place stated in the conference program.
2. Semifinalist teams present to the judges explaining the manufacturing process used in the production of the product.
3. The presentation is followed by an interview.
4. The LEAP Response is reviewed by the judges.
5. Ten (10) finalists are announced at the awards ceremony.
6. No more than two (2) students pick up their team's entry from the display area at the time and place stated in the conference program.

REGULATIONS AND REQUIREMENTS

PRE-CONFERENCE

A. Documentation

1. Documentation materials (comprising a “portfolio”) are required and should be secured in a clear front report cover (click [here](#) for a sample).
2. The report cover must include the following single-sided, 8½" x 11" pages, in this order:
 - a. Title page with the event title, the product name, the conference city and state, the year, and the team/chapter ID number; one (1) page
 - b. Table of contents
 - c. Description of the product: a written description of the product, instructions for its use, the overall advantages and usefulness of the product, its audience, and related safety considerations; one (1) page
 - d. Design efforts: sketches, pictures, magazine clippings, and other graphic design elements used in the development of the final design; three (3) pages maximum
 - e. Drawings:
 - i. An orthographic drawing in three (3) views with dimensions to aid production; one (1) page
 - ii. An assembly drawing or a pictorial drawing with labels; one (1) page
 - f. Materials list: a list of materials (including sizes and market value) used to fabricate the product; each item or sub-assembly should be identified as student produced, standard stock item, or purchased subassembly; one (1) page
 - g. Tools and machines list: a list of any hand, power, and stationary tools and/or machines used to fabricate the product; one (1) page
 - h. Production plan: a production outline or flow chart; up to two (2) pages
 - i. Photographic verification: photographic or digital images that verify the mass production of three (3) total identical copies including the prototype; up to two (2) pages

3. All documentation, with the exception of the LEAP Response, must be contained in the portfolio.
 4. Tabs or dividers may be used between sections of the portfolio and are not counted as pages.
 5. Sheet protectors may be used.
- #### B. Prototype of product
1. Craftsmanship
 - a. The product must display good craftsmanship.
 - b. The product must maintain tolerances as indicated by the working drawings.
 2. Appropriate materials: The product must use the materials in a manner that adds value to the product.
 3. Efficiency of design: The product must address the identified consumer need, and use the materials effectively.
 4. Aesthetics: The product must be pleasing to view.
 5. Ergonomics: The product must be easy to use.
 6. Appropriate solution: The product must function in a manner that solves the identified problem.
 7. Creativity: The product must display an original solution to the identified consumer need.
 8. ONLY the documentation contained within the portfolio and the prototype may be submitted for judging.
 9. The documentation and prototype must be displayed in such a way that they do not exceed 15" deep x 15" wide x 15" high. Participants are encouraged to stack their items to avoid exceeding these limits.
 10. A twenty percent (20%) deduction of the total possible points will take place should the three product copies and documentation be displayed in a manner that exceeds the dimensions outlined.

PRELIMINARY ROUND

- A. No more than two (2) team members may turn in an entry.
- B. Entries are independently reviewed by judges with neither students nor advisors present.

SEMIFINAL ROUND

- A. Two (2) team members may participate in the presentation/interview.
- B. Participants will have three to five (3-5) minutes to explain their manufacturing process, finished product, and a plan to market their product.
- C. Teams may bring and use audio/visual materials and a laptop for their presentation.
- D. The LEAP Response:
 1. Teams document the leadership skills the team has developed and demonstrated while working on this event and on a non-competitive event leadership experience.
 2. Find the specific LEAP Response regulations in the LEAP Program section of this guide and on the [TSA website](#).

EVALUATION**PRELIMINARY ROUND**

1. The documentation and the prototype

SEMIFINAL ROUND

1. The presentation/interview and the content and quality of the LEAP Response

Refer to the official rating form for more information.

STEM INTEGRATION

This event has connections to the STEM areas of Science, Technology, Engineering, and Mathematics.

CAREERS RELATED TO THIS EVENT

This competition has connections to one (1) or more of the careers below:

- Electromechanical engineer
- Mechanical drafter
- Production planner
- Standards engineer

MASS PRODUCTION

2020 & 2021 OFFICIAL RATING FORM

MIDDLE 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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- Portfolio is present
 - Prototype is present
 - Completed LEAP Response is present
 - ENTRY NOT EVALUATED

STATIC ENTRY (110 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 See Regulation A (X1)	Portfolio is missing several components and/or is unorganized; it is messy and lacking quality.	Most components are included; portfolio is generally organized and displays some quality.	All components are included; effort and quality of work are evident.	
Description of product Instructions for use (X1)	Description of the product and instructions for its use are unclear.	Description of the product and instructions for its use are defined and explained.	Description of the product and instructions for its use are defined and explained precisely.	
Design efforts (X1)	Most design effort components are missing, and/or they are unorganized; they are messy and lack quality.	Some design effort components are included; they are generally organized and display overall quality.	Design effort components are included; effort and high quality of work are evident.	
Working drawings (X1)	Working drawings are sloppy and disorganized; they do not demonstrate labeling and dimensioning.	Working drawings are of sufficient quality, and most are labeled and dimensioned.	Working drawings are of excellent quality and are correctly labeled and dimensioned.	
Materials list Tools and machines list (X1)	Lists are missing several components, and/or they are unorganized.	Most components are included; the lists are generally organized and complete.	All components are included and organized in the lists.	
Production plan (X1)	Plan is missing several components, and/or it is unorganized.	Components of the plan are mostly included, and the plan is generally organized.	All components are included and well-organized in the plan.	
Photographic verification (X1)	Photographic verification is not complete, and/or images are missing.	Photographic verification is complete, and the quality of images is adequate.	Photographic verification is clear and supports all aspects of the process.	
Product (X2)	Product is not built to detailed standards; it is poorly constructed and finished; it lacks creativity and imagination.	Product is somewhat built to detailed standards; the design is satisfactory and works, and creativity or uniqueness are somewhat apparent.	Product is built to detailed standards, and it is of a quality that could be purchased by a consumer; the design is unique and demonstrates creativity.	

STATIC ENTRY (110 points) – continued

Product functionality (X1)	Little specific functionality per the original specification is demonstrated.	The product meets some of the functionality per the original specification.	The end product exhibits functionality as per the original specifications.	
Tolerance of example (X1)	Materials are not joined cleanly and are not consistent with working drawings.	Materials are somewhat joined cleanly and are fairly consistent with working drawings.	Materials are joined cleanly and are consistent with working drawings.	
STATIC ENTRY SUBTOTAL (110 points)				

Rules violations (a deduction of 20% of the total possible points for the above sections) must be initiated by the judge, coordinator, and manager of the event. Record the deduction in the space to the right.

Indicate the rule violated: _____

PRELIMINARY SUBTOTAL (110 points)

SEMIFINAL PRESENTATION/INTERVIEW (88 points)

CRITERIA	Minimal performance	Adequate performance	Exemplary performance	
	1-4 points	5-8 points	9-10 points	
Organization Use of audio/visual materials (X1)	Participants seem unorganized and unprepared for the presentation/ interview; illogical explanation of the product is presented; team exhibits difficulty with the use of audio/visual materials.	Participants are generally prepared for the presentation/interview; explanation of the product is communicated and generally organized; audio/visual materials are used somewhat effectively.	The presentation/interview is logical, well organized, and easy to follow; explanation of the product is communicated in an organized and concise manner; the use of audio/visual materials is effective, organized, and logical.	Record scores in the column spaces below.
Knowledge (X2)	Participants seem to have little understanding of the concepts in their project; the presentation, does not clearly define the product; answers to questions may be vague.	Participants exhibit an understanding of the concepts in their project; the presentation is, for the most part, logical and/or clear.	Participants show clear evidence of a thorough understanding of the project; the presentation is concise and logical.	
Articulation (X1)	The presentation/interview lacks clarity, and/or there is insufficient information provided describing the project.	The presentation/interview is somewhat logical, easy-to follow, and/or there is sufficient information describing the project.	The presentation/interview is clear, concise, and there is ample information describing the project.	
Integration of theme (X2)	The current theme is not demonstrated in the product and/or the product is not realistic and functional.	The current theme is adequately demonstrated in the product, and the product is generally realistic and functional.	The current theme is exceptionally well demonstrated in the product, and the product is extremely realistic and functional.	
Delivery (X1)	The team is verbose and/or uncertain in its presentation/ interview; participants' posture, gestures, and lack of eye contact diminish the presentation/interview.	The team is somewhat well-spoken and clear in its presentation/ interview; participants' posture, gestures, and eye contact are acceptable in the presentation/ interview.	The team is well-spoken and distinct in its presentation/interview; the participants' posture, gestures, and eye contact result in a polished, natural, and effective presentation/ interview.	

SEMIFINAL PRESENTATION/INTERVIEW (88 points) – continued					
LEAP Response (18 points; 10% of the total event points)	The team's efforts are not clearly communicated, lack detail, and are unconvincing; few, if any, attempts are made to identify and incorporate the SLC Practices.	The team's efforts are adequately communicated, include some detail, are clear, and are generally convincing; identification and incorporation of the SLC Practices are satisfactory.	The team's efforts are clearly communicated, fully-detailed, and convincing; identification and incorporation of the SLC Practices are excellent.		
SEMIFINAL LEAP INTERVIEW SUBTOTAL (88 points)					
<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>					
SEMIFINAL SUBTOTAL (88 points)					
<p>To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.</p>				TOTAL (198 points)	

Comments:

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

JUDGE

Printed name: _____ Signature: _____

MASS PRODUCTION

EVENT COORDINATOR INSTRUCTIONS

PERSONNEL

- A. Event coordinator
- B. 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 each judge
 - 2. TSA Event Coordinator Report
 - 3. List of judges/assistants
 - 4. Stick-on labels for identifying entries
 - 5. Results envelope with coordinator forms
- B. Tape measure to determine the size of the product
- C. Display tables for entries
- D. Chairs for event coordinator and judges

RESPONSIBILITIES

AT THE CONFERENCE

1. Report to the CRC room and check the contents of the coordinator's packet.
2. Review the event guidelines and check to see that enough personnel have been scheduled.
3. Inspect the area(s) 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.
4. At least one (1) hour before the event is scheduled to begin, meet with judges/assistants to review time limits, procedures, and regulations. If questions arise that cannot be answered, speak to the event manager before the event begins.

CHECK-IN

1. Check-in the entries at the time stated in the conference program.
2. Participants check-in:
 - a. The documentation portfolio
 - b. One (1) prototype
 - c. The LEAP Response
4. Late entries are considered on a case-by-case basis and only when the lateness is caused by events beyond the participant's control.
5. In order to compete, participants must be on the entry list or must have approval of the CRC.
6. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
7. Each entry must include the participant's identification number in the upper right-hand corner of the entry.

PRELIMINARY ROUND

1. Position documentation and products for viewing by judges.
2. Judges independently assess the entries.
3. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
 - To deduct twenty percent (20%) of the total possible points in this round
 - To disqualify the entry

The event coordinator, judges and CRC manager must all initial either of the violations on the rating form.

4. Judges determine the twelve (12) semifinalists and discuss and break any ties.
5. Submit semifinalist results to the CRC room.

SEMIFINAL ROUND

1. Two (2) team members may participate in the presentation/interview.
2. Participants will have three to five (3-5) minutes to explain their manufacturing process, finished product, and a plan to market their product.
3. Teams may bring and use audio/visual materials and a laptop for their presentation.
4. Judges independently assess the semifinal presentation/interview and LEAP Response.
5. Discuss rule violations (e.g. 20% deduction, disqualification) and have all relevant parties initial the rating form.
6. Judges determine the ten (10) finalists and discuss and break any ties.
7. Submit the finalist results and all related forms in the results envelope to the CRC room.
8. If necessary, manage security and the removal of materials from the event area.