

# MASS PRODUCTION



## OVERVIEW

Applying leadership and 21<sup>st</sup> century skills, participants manufacture a marketable product addressing the annual theme, noted on the [TSA website](#) under *Themes & Problems*. Teams create three (3) identical copies of a product 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. Semifinalists present their product and participate in an interview.

## ELIGIBILITY

One (1) team of at least three individuals per chapter may participate.

## TIME LIMITS

Ten (10) minutes are allowed for the semifinal presentation and interview broken down as follows:

- A. One (1) minute for set-up
- B. Seven (7) minutes for the presentation
- C. Two (2) minutes to respond to questions from judges

## ATTIRE

TSA competition attire is required.

## PROCEDURE

### PRE-CONFERENCE

- A. Participants access the annual theme on the [TSA website](#) under *Themes & Problems*.
- B. Participants research designs for products and develop a prototype that can be replicated for three (3) identical copies of the product. Only one (1) prototype will be submitted on-site as a part of the entry.
- C. Create working drawings and devise production plan flow chart(s).
- D. Tool up for production.
- E. Conduct a trial run and evaluate the process for effectiveness and efficiency.

- F. Manufacture several products using line production techniques.
- G. Document the process with photographic images of the additional copies of the prototype as part of the portfolio submission.
- H. Document the team project with a photo timeline.

### PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
  - 1. One (1) prototype
  - 2. The documentation portfolio
- B. Entries are reviewed by judges with neither students nor advisors present.
  - 1. Judges score the Prototype criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.
  - 2. Judges score the Documentation criteria of those top twenty-four (24) contestants to determine the top twelve (12) semifinalist teams.
- C. A list of twelve (12) semifinalist teams (in random order) is posted.

### SEMIFINAL ROUND

- A. One (1) team representative reports at the time and place stated in the conference program to sign-up for a presentation time.
- B. Up to three (3) team representatives report at least ten (10) minutes prior to their assigned time to the designated place for their presentation.
- C. Semifinalist team representatives participate in the on-site presentation and interview.
- D. Team representatives pick-up their entry from the display area at the time and place stated in the conference program.
- E. 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.

### PRE-CONFERENCE

#### A. Documentation Portfolio:

1. Documentation portfolio is 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 product name, the conference city and state, the year, and the team/chapter ID number; one (1) page
  - b. Table of contents; pages as needed
  - 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; maximum three (3) pages
  - 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; pages as needed.
  - i. Photo/Film/Video Consent and Release Forms. If the entry contains images of people (minors require parental consent), proof of consent must be included for each person (see Forms Appendix); pages as needed
  - j. Work Log (see Forms Appendix); pages as needed
2. All documentation must be contained in the portfolio.
3. Tabs or dividers may be used between the sections of the portfolio and are not counted as pages.
4. The documentation portfolio will be collected by the coordinator during event submission and placed with the prototypes following all submissions.

#### B. Prototype of Product:

1. The prototype must be displayed in such a way that it does not exceed 15" deep x 24" wide x 24" high. The documentation portfolio will be collected by the coordinator and placed with the prototypes following all submissions.
2. Craftsmanship:
  - a. The product must display good craftsmanship.
  - b. The product should show creative thinking by the students.
3. Appropriate materials: The product must use the materials in a manner that adds value to the product.
4. Efficiency of design: The product must address the identified consumer need, and use the materials effectively.
5. Aesthetics: The product must be pleasing to view.
6. Ergonomics: The product must be easy to use.
7. Appropriate solution: The product must function in a manner that solves the identified problem.
8. Creativity: The product must display an original solution to the identified consumer need.

9. ONLY the documentation contained within the portfolio and the prototype may be submitted for judging.

### PRELIMINARY ROUND

- A. No more than two (2) team representatives report at the time and place stated in the conference program to check in:
  1. One (1) prototype
  2. The documentation portfolio
- B. Entries are independently reviewed by judges with neither students nor advisors present.
- C. Once the display set-up time frame has closed, participants may not re-enter the event area.

### SEMIFINAL ROUND

- A. Using leadership and/or 21<sup>st</sup> century skills, the goal of the team is to demonstrate their skill and knowledge pertaining to the mass production process.
- B. The presentation is limited to three (3) team representatives. Each member should be an active participant in the presentation.
- C. Representatives may reference their documentation portfolio and prototype during the presentation and interview.
- D. Teams may bring and use audio/visual materials or a laptop for their presentation. AC power will not be provided or available. Projectors and screens are not permitted.
- E. Time limits:
  1. One (1) minute for set-up
  2. Seven (7) minutes for presentation
  3. Two (2) minutes to respond to questions from judges
  4. A five-(5) point deduction will be incurred for any time infraction.

## EVALUATION

### PRELIMINARY ROUND

#### Tier 1

- A. The prototype

#### Tier 2

- B. The documentation portfolio

### SEMIFINAL ROUND

- A. The presentation/interview

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.

## 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:

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

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## 2024 & 2025 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.

- ☐ TIER 1 – One (1) copy of the prototype is present and does not exceed 15" x 24" x 24"
- ☐ TIER 2 – Documentation portfolio is present
- ☐ ENTRY NOT EVALUATED

TIER 1 – PROTOTYPE (40 points)				
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; creativity or uniqueness are somewhat apparent.	Product is built to detailed standards, and is of a quality that could be purchased by a consumer; the design is unique and demonstrates creativity.	
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.	
TIER 1 – PROTOTYPE SUBTOTAL (40 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: _____				
TIER 1 – SUBTOTAL (40 points)				



TIER 2 – DOCUMENTATION PORTFOLIO (70 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 Components</b> (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 in order; effort and quality of work is evident.	
<b>Description of Product</b> Instructions for use (X1)	Description of the product and instruction for its use are unclear.	Description of the product and instructions for its use are somewhat defined and explained.	Description of the product and instructions for its use are defined and explained precisely.	
<b>Design Efforts</b> (X1)	Most design effort components are missing, and/or they are unorganized; they are messy and lack quality.	Some design effort components are included; components are generally organized and display overall quality.	Design effort components are included; effort and high quality of work is evident.	
<b>Working Drawings</b> (X1)	Working drawings are sloppy and disorganized; they do not demonstrate labeling and dimensioning.	Working drawings are of sufficient quality; most are labeled and dimensioned.	Working drawings are of excellent quality and are correctly labeled and dimensioned.	
<b>Materials List Tools and Machines List</b> (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.	
<b>Production Plan</b> (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.	
<b>Photographic Verification</b> (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.	
<b>TIER 2 – DOCUMENTATION PORTFOLIO SUBTOTAL (70 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 (110 points)</b>				

SEMIFINAL PRESENTATION/INTERVIEW (70 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> Use of audio/visual materials (X1)	Participants seem unorganized and unprepared for the presentation; illogical explanation of the product is presented; team exhibits difficulty with the use of audio/visual materials.	Participants are generally prepared for the presentation; explanation of the product is communicated and generally organized; audio/visual materials are used somewhat effectively.	The presentation 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.	

SEMIFINAL PRESENTATION/INTERVIEW (70 points) – continued					
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 clear.	Participants show clear evidence of a thorough understanding of the project; the presentation is concise and logical.		
Articulation (X1)	Communication of the project is unclear, unorganized, and/or illogical; leadership and/or 21 <sup>st</sup> century skills are not evident.	Communication of the project is somewhat logical and clear; leadership and/or 21 <sup>st</sup> century skills are somewhat evident.	Communication of the project is clear, concise, and logical; leadership and/or 21 <sup>st</sup> century skills are clearly evident.		
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 fairly 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; participants’ posture, gestures, and eye contact result in a polished, natural, and effective presentation/ interview.		
SEMIFINAL PRESENTATION/INTERVIEW SUBTOTAL (70 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: _____	
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TIME DEDUCTIONS	
A five-(5) point deduction will be incurred for any time infraction.	

SEMIFINAL SUBTOTAL (70 points)	
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To arrive at the TOTAL score, add any subtotals and subtract rules violation points, as necessary.	TOTAL (180 points)	
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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 for 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. Display tables for entries
- C. Table and chairs for team presentations, as needed
- D. Stopwatch
- E. Measuring tape
- F. Table and chairs for event coordinators and judges

### RESPONSIBILITIES

#### AT THE CONFERENCE

- A. Attend the mandatory event 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, 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.

### CHECK-IN

- A. Check in the entries at the time stated in the conference program.
- B. No more than two (2) team representatives may check in:
  1. One (1) prototype
  2. The documentation portfolio
- C. Late entries are considered on a case-by-case basis and only when the 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 of the CRC.
- E. Requirements for attire do NOT apply during check-in, only on the first day of the conference.
- F. Each entry must include the team's identification number in the upper right-hand corner of the documentation portfolio and somewhere visible on the model/prototype.

### PRELIMINARY ROUND

- A. Judges independently review the entries based on the following criteria:

#### Tier 1

Judges score the prototype criteria to determine the top twenty-four (24) preliminary contestants, which will not be posted.

#### Tier 2

Judges score the documentation criteria of those top twenty-four (24) contestants to determine the top twelve (12) semifinalist teams.

- B. Decisions about rules violations must be discussed and verified with the judges, event coordinator, and the CRC manager to determine either:
  1. To deduct twenty percent (20%) of the total possible points in this round
  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 and discuss and break any ties.
- D. Submit semifinalist results to the CRC room.
- E. Create a sign-up sheet for semifinalist presentations and communicate any instructions to the semifinalist participants.
- F. Manage the pick-up of non-semifinalist entries.

### SEMIFINAL ROUND

- A. Prepare a list of five to ten (5-10) standard interview questions to be asked of all participants.
- B. Semifinalists report to sign-up for the presentation at the time and place stated in the conference program.
- C. Check in semifinalists and confirm with the teams their order of presentation and the procedure. Team representatives should report at least ten (10) minutes prior to their assigned time to the designated place for their presentation.
- D. Manage the presentations and interviews.
- E. If judges ask questions, they should be the same questions for each team for the purpose of comparing one team to another.
- F. Discuss rule violations and have all relevant parties initial the rating form.
- G. Judges independently assess the semifinal presentation and interview.
- H. Judges determine the top ten (10) finalists and discuss and break any ties.
- I. Submit the finalist results and all related forms in the results envelope to the CRC room.
- J. If necessary, manage security and the removal of materials from the event area.