



How To Prepare For The Competition

- **Form a team of interested students or friends.** Each team must have at least one coach—a teacher or other adult to help and advise—though a single adult may coach more than one team.
- **Plan the timing of the project.** Make sure everyone knows the due date for the written report and recognizes that all major development work should be finished before then.
- **Consult library books and other resources.**
- **Test and improve the design continuously.**
- **Keep careful records** of meetings and working drawings and share responsibility for different sections of the final report.

Notes to Adults

- *The Maryland Engineering Challenge organizers would like to stress that the majority of the work on all phases of the project is to be done by the students.*
- **Adult assistance is to be limited** to: mentoring students; teaching principles applicable to the project; assisting in production of the report and drawings; overseeing manufacturing of the project; performing any process that may pose a safety hazard to students (taking due account of their ages).
- **Guidance should be in the form of questions** (leading questions, if necessary) to promote creative thinking by the students.
- **Consider attending a Coaches' Workshop** to get assistance for your team(s).

Evaluation Criteria

The grading for each section varies for each challenge. The information below gives an indication of what the judges are looking for in each section. For maximum points, all criteria for each section must be fulfilled.

WRITTEN REPORT

- Content and organization. Reports should contain all sections described below
- Style and presentation (form, format, mechanics, and visuals)
- Timeliness – *1 point will be deducted for each day the report is late.*

ORAL REPORT

- Poise of representatives
- Knowledge and preparation of representatives
- As part of the process in preparing for the competition, each team must identify one or more representatives. These people will be given 5 to 10 minutes to make a presentation and answer questions, appropriate to the age of the students, on how the team designed their entry and the underlying scientific principles. Supporting materials, such as a display board with photographs of the work in progress, are often helpful here. Consult the individual challenge documents for further details of what will be required.

DESIGN & CONSTRUCTION

- Achievement of design specifications
- Creativity of structural design
- Quality of construction
- Finished enhancements

PERFORMANCE

- Achievement of performance goals
- Ease of operation
- This is the most exciting part of the Engineering Challenge Program. Each team has the opportunity to demonstrate to the judges (and usually an interested audience) that their hard work resulted in an operational project that really works!
- The judges will examine each entry to make sure it fits the specifications given in the individual challenge document (read this carefully). Points will also be awarded for creativity (any original design features), quality of construction (how well made it is), and appearance (decoration and finish).

The High School Level Report should be presented in the following format:

- **Title Page** — Include name of challenge, team name and logo, name of school or organization, names of students, name of teacher or advisor
- **Table of Contents**
- **Summary (abstract)** — Clearly and concisely stated
- **Introduction** — Give background information and set the scene
- **Body** — The main part of the report. This may be divided into several sections (such as Design, Development, etc). Specific directions will be provided in the individual challenge instructions. In general, this part should:
 - Explain the reasons behind your design (at an appropriate level for the age of the students). Why did you design your entry the way you did?
 - Explain the scientific principles behind your design.
 - Include drawings (with titles and labels) and design calculations.
 - Explain how you tested your design, and the improvements this led you to make.
 - Describe the problems that you encountered in designing and building your product. How did you solve these problems?
- **Conclusions (and Recommendations)** — How successful is your project? What did you learn by taking part? What did you learn about your aptitude for engineering related careers?
- **Acknowledgments** — List the names of the adults who assisted you in the project with a brief description of what they did. Include a certification, signed by all student team members and adults assisting, stating that: ***“We hereby certify that the majority of the ideas, design, and work was originated and performed by the students, with limited assistance by adults, as described above.”***
- **Bibliography** — List all references used, including internet, books and magazines.
- **Appendices** — Should be introduced, integrated, and discussed in the body text. Should include:
 - A. **Safety** — List the *general* safety procedures that were followed to make sure that no one got hurt. (Any *special* safety procedures that were needed should be described in the body of the report.)
 - B. **Team members** — List the team members, with a short description of how each person helped to make the project a success. What special skills were learned or demonstrated?
 - C. **Scheduling and Accomplishments** — Show on a time line, or similar method, how you scheduled your project. Include *brief* records of meetings, telling how you managed the schedule.
 - D. **Material Resources** — Provide a record of all materials used with their costs. Include an estimate of the value of donated materials. Give the total cost. Credit will be given for economical use of resources.
 - E. **Tools and Machines** — List and describe any special tools or machines that were used.
 - F. **Working Drawings** — Include working drawings not contained in the design section.

A SUPPLEMENTARY REPORT may be submitted on the day of the competition, and will be awarded marks at the discretion of the judges. It should cover only activities conducted since the submission of the main report, and is NOT intended to replace the main report.