



THE AMERICAN ROCKETRY CHALLENGE

2020 ENGINEERING NOTEBOOK COMPETITION RULES



OVERVIEW

The goal of the Engineering Notebook competition is to document the steps and engineering decisions your team made in the process of creating and flying your rocket. Write about your team's concepts and designs, the reasons why your team made mission-critical choices, and the results of your testing and hard work.

A team's Engineering Notebook should serve as a written guide- someone familiar with rocketry should be able to pick up your notebook, assemble a duplicate of your rocket, and pick up right where your team left off. This process is essential in aerospace engineering when dozens of engineers work on different parts and need to be able to understand each other's work.

The winning team, as judged by a panel of industry engineers, will receive a \$1,000 prize.

TEAM REQUIREMENTS

Each team registered for the 2020 competition is eligible to submit an entry to the 2020 Engineering Notebook competition. Engineering notebook entries must be made in chronological order and present a timeline of your team's work. None of the activities for the engineering notebook may be done by any adult or company under the 2020 competition rules.

NOTEBOOK REQUIREMENTS

Engineering notebooks submissions may either be electronic or physical. Physical notebooks must be no less than 203.2mm (8.0 inches) by 254mm (10.0 inches) and must not exceed 254mm (10.0 inches) by 304.8mm (12.0 inches). Notebooks should be hardbound. Loose-leaf binder compositions are not permitted. You may use any notebook that meets these specifications. An example is provided [here](#). All physical notebook entries must also be in pen.

Electronic submissions can be either a scanned page by page copy of an original hard copy notebook or a digital notebook submitted in .pdf format.

In all notebooks, pages must be numbered, contain titles, and the full date (Month, Day, Year) in the upper outer corner of each entry. New entries must be made on a new page of the notebook. The notebook must remain in chronological order. Entries must be made neatly and with enough detail that another person familiar with rocketry could replicate your process and results. The initials of each team member who is present during each entry must be documented in addition to the dated signatures of both the student team leader and the team supervisor if present.

i) Title Page

The title page must be on either the inside cover of the notebook or the first page. The title page must include the team name, team members (with the identification of the team leader), the teacher/adult supervisor, the date the engineering notebook was created, and the contact information of the team. If there are multiple notebooks in a single entry, then the volume number must be listed as well.

ii) Table of Contents

A table of contents must be added after the front of the notebook. Each entry, and its corresponding page number, should be contained within the table of contents.

iii) Content

All entries must be recorded as they occur. Group meetings, discussions, ideas, questions, and notes may be included as part of the engineering notebook. References to relevant articles or research findings must be made such that the reference can easily be retrieved by another person familiar with rocketry. The contents of the notebook should contain preliminary rocket plans, flight data, evaluation of the flight data, modifications to rocket plans, and the reasoning behind project decisions. If you finish an entry before the end of a page within a notebook, draw a large X taking up the remainder of the page. This prevents new content from being added to the notebook after the fact.

(1) Rocket Designs

Rocket schematics must contain dimension, material, and fabrication process information. Rocket designs may be drawn directly into the notebook. Rocket designs that are completed electronically may be printed and affixed to the notebook. The dimensions of the rocket must be labeled in millimeters. Materials information for each of the displayed components of the rocket design must be given. Fabrication processes and or sourcing information for all non-trivial parts of the rocket should be included.

(2) Flight Data

For each flight taken, record the relevant current environmental conditions, the flight location, the team members who are present, as well as adult supervisors or mentors who are present. Teams should also record the details of the rocket that is being tested, including rocket name, dimensions, pre-flight rocket mass, chosen engine and its lot number. If applicable, record the details of any circumstances that may affect the flight. After the flight, record the peak altitude reading from the altimeter, the duration of the flight, the status of each of the eggs, the status of the rocket, the calculated score, post-flight rocket mass, and any other flight information as needed.

(3) Rocket Modifications

Modifications that are made to the rocket must be documented. Your notebook entry should specify the reasons for the modifications and the specific components of the rocket that were modified. You must also specify if a new flight vehicle was constructed, and the reason for the construction of the new vehicle.

(4) Affixed Materials

Materials that are affixed to the notebook must be securely attached with clear tape or staples. This may be done by taping each corner of the materials that are to be affixed to the notebook. Affixed materials should contain the date they were added, titles, the reason for their addition to the notebook, a description, and be initialed by the team leader.

iv) Notebook Maintenance

(1) Revisions

Errors in the notebook should not be omitted from the submission. Correction tape or white-out may not be used to write over errors that are present. Errors may be corrected by crossing them out with an X or a single line. Errors should still be legible despite the X or single line. Pages should not be removed from the notebook.

(2) Updates

Updates that specifically reference previous entries may be made by creating a new entry, referencing the page number that the update pertains to, and continuing the entry as normal.

SCORING

Engineering notebooks will be scored on a 100-point scale, based on the following criteria:

Organization and Presentation (20 Points)

- Does the notebook comply with the formatting criteria?
- Is the content clear, legible, and easy to understand?
- Are organization aids, including page numbers, a table of contents, and section headings effectively used?

Content (40 Points)

- Does the content follow the team's engineering process from beginning to end?
- Does the engineering notebook clearly explain the team's design considerations and the reasoning for their ultimate decisions?
- Would the notebook enable someone familiar with the competition and rocketry to reproduce a copy of their rocket and flight procedures at any stage in the design cycle?
- Does the notebook contain drawings, photos, or other schematics, as necessary to accomplish the above goals?

Data and Analysis (20 Points)

- Does the engineering notebook contain results data for flights?
- Does the engineering notebook clearly explain how and why the rocket was adjusted in response to the gathered data?
- Does the team use results data to make performance converge towards the stated mission parameters?

Creativity (10 Points)

- Does the team propose or execute innovative or unique solutions to address design or performance concerns?

JUDGING

Engineering notebooks will be judged by a panel of engineers from American Rocketry Challenge sponsor companies, based on the scoring criteria above. Each submission will be judged by at least three different reviewers, and teams may request their rubrics upon the conclusion of the competition.

PRIZES

The winning team will receive a \$1,000 prize along with a commemorative plaque. Should no entry receive an average score higher than a 70, no prize will be awarded. All teams that submit entries will receive individual certificates and thank-yous from our sponsors congratulating them on their hard work in the 2020 Engineering Notebook competition.

SUBMISSIONS

All entries are due by Friday, May 1.

Given the current pandemic situation, there is a strong preference for electronic submissions.

Physical engineering notebooks should be postmarked no later than May 1, 2020. Physical engineering notebooks must be addressed to AIA's Office, located at 1000 Wilson Boulevard, Suite 1700, Arlington, Virginia, 22209.

Electronic submissions must be in PDF format and emailed to rocketcontest@aia-aerospace.org no later than May 1, 2020. If your PDF exceeds 10 megabytes, please host the file online and provide access instructions in your submission email.