




NASA Student Launch ARW Milestone & Design Reviews

PRESENTED BY NASA Student Launch

DATE July 24, 2023

A photograph of four students in a workshop setting. They are gathered around a table, looking at a model of a rocket. One student is pointing at the model while others look on. The background shows a wall with various posters and documents, including one titled "RESULTS/CONCLUSION". The students are wearing dark blue t-shirts with "NASA Student Launch" and "NASA ORANGE COUNTY" printed on them. One student has a lanyard with a badge around his neck.

NASA STEM

Milestone Timeline



Proposal – September 11

Preliminary Design Review (PDR) Package – October 26

Critical Design Review (CDR) Package – January 8

Flight Readiness Review (FRR) Package – March 4

Post-Launch Assessment Review (PLAR) – April/May

PDR, CDR and FRR Milestone submissions are followed by a presentation and review with the NASA Student Launch Review Panel.





Before you start any aspect of the project, we *strongly* recommend reading the SLI Section of the NASA Student Launch Handbook

- Outline of ALL NASA Student Launch requirements
- Guidance for writing your proposal, reports, and presentations

[Link to the 2024 NASA SL Handbook \(Release Date: Aug 14\)](#)

[Link to the 2023 NASA SL Handbook \(last year's\)](#)



Proposal Overview

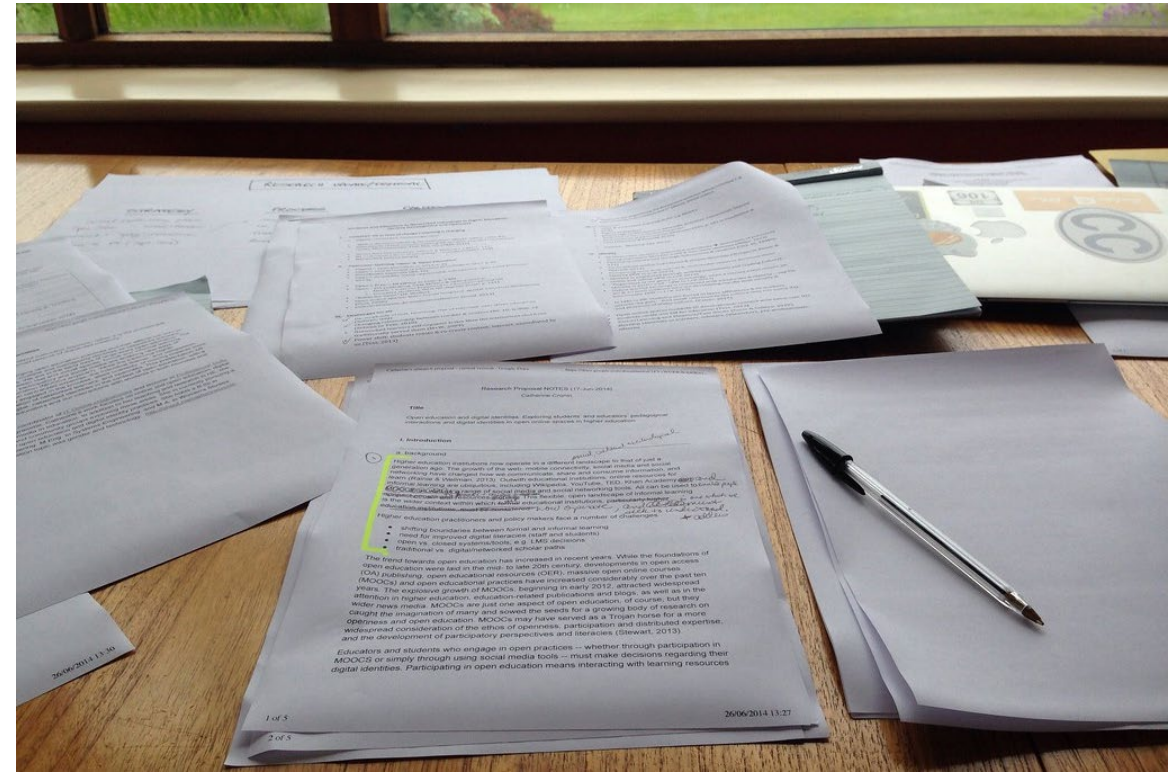


Official “application” to participate Student Launch.

Not all proposals are accepted.

Show the Student Launch (SL) Management Team that your team is ready to handle the program requirements.

It is an *overview* of your design ideas and options. This is NOT a design review



Proposal: Excerpt of what should be included



General Information

- Cover page, mailing address, student team leader and safety officer info, team member and adult educators' info (up to 2), and team organizational structure and team contact information.
- National Association of Rocketry (NAR) or Tripoli Rocketry Association (TRA) section and mentor

Facilities

- Provide a description for all the facilities (meeting rooms, workspace, labs, etc.) and equipment/tools available to you and your manufacturing capability.

Safety (include MSDS)

Technical Design

- General vehicle/payload design ideas and dimensions, proposed recovery, and propulsion systems.
- Drawings, diagrams, CADS
- Address all handbook requirements, and major challenges.

STEM Engagement – Include plans, and evaluation criteria

Project Plan

- Complete Timeline. (Include as much detail as possible.)
- Budget & Funding Plan. Every item you plan to use, and their market values. Include taxes, shipping, vendors, what you have on hand, etc. How will you acquire funds? How much do you need?

ALL requirements for what to include in your team's proposal can be found in the NASA SL Handbook



Submitting your Proposal



Due September 11, 2023, by 8:00 am CDT.

Late Proposals will not be accepted for any reason

- Proposals will be submitted into the NASA STEM Gateway System.
- Instructions for submission will be posted to the webpage when 2024 Handbook is released on Aug 14.
- Email a copy to John Eckhart (john.r.eckhart@nasa.gov) and Zachary Koch (zachary.a.koch@nasa.gov)

Submit as a PDF with the following naming convention:

School/Institution Name – 2024 – Proposal

ex: Oakwood High School – 2024 – Proposal



Address every requirement bullet, in order, in the appropriate section in the handbook.

- Have multiple people (on the team or outside of the team) proofread your document!
- Be aware of your page count, consistency in font style and size, spacing, spelling, and grammar. No small 12pt. - (e.g., Time New Roman). Only one or two fonts throughout the report. (Title and Text)
- Use Imperial System of Measurement system in report. Be consistent.
- Include pictures, schematics, diagrams, CAD models for as-designed system in as much detail as possible.
- All documents should be clear, professional, readable and logical.
- Change a page from portrait to landscape, if needed, to fit tables or diagrams. (this is helpful to us)
- If you attached a table or graph, make sure it is readable. (e.g., use high resolution images). Label your figure, images, and tables.
- Do not put data in paragraphs, use tables and figures
- Show hand calculations if any were done.
- Table of contents should match your page numbers in your report.
- Document any simulation software that evaluates a design performance. Show and explain!



Milestone Reports



Preliminary Design Review (PDR)

Deliverables: Report, Presentation, Flysheet

- Present early design ideas *and* alternatives.
- Use research to justify decisions for all design aspects. Include trade studies
- Provide early predictions for flight performance for all designs and declare target altitude
- Begin the initial steps to verify all SL requirements, and make some of your own

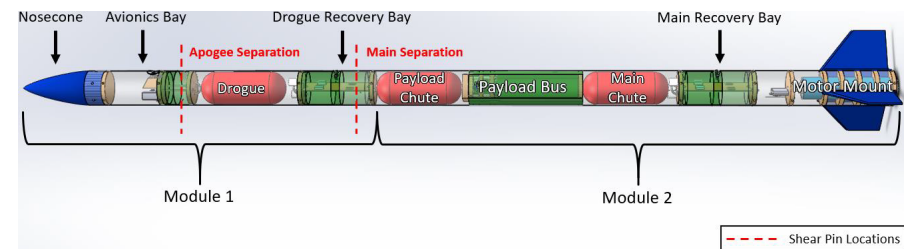
Table 3.3-10 Nose cone comparison

| | Von Kármán (Haack Series C-0) | Ellipsoid | Conical |
|-------|---|--|--|
| Pros: | <ul style="list-style-type: none">• Lowest drag coefficient• Highest stability• Moderate weight | <ul style="list-style-type: none">• Moderate drag coefficient• Moderate stability• Rounded tip | <ul style="list-style-type: none">• Low weight• Easiest to manufacture• Simplest Shape |
| Cons: | <ul style="list-style-type: none">• Most complex shape• More material required | <ul style="list-style-type: none">• Most amount of material• Heaviest | <ul style="list-style-type: none">• Highest drag coefficient• Low stability• Weak at tip |

Critical Design Review (CDR)

Deliverables: Report, Presentation, Flysheet

- Present a FINAL vehicle, recovery and payload design
- Justify your final design decisions
- Make final motor selection
- Define verification plans for both NASA SL requirements and your own.
- Analysis and report of subscale flight data



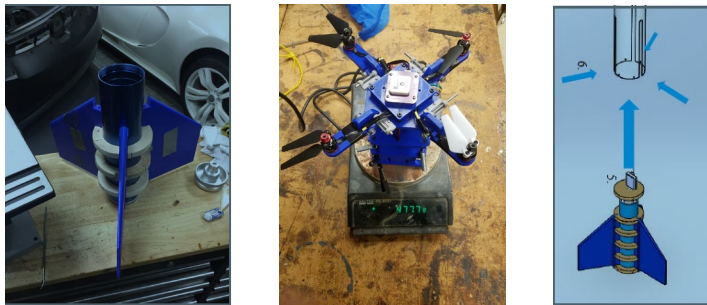
ALL requirements for what to include in your team's milestone packages can be found in the NASA SL Handbook



Flight Readiness Review (FRR)

Deliverables: Report, Presentation, Flysheet

- Present as built designs. Construction methods, diagrams and procedures.
- Analysis and report of full-scale test flight
- All testing results
- All NASA SL and team requirements verified
- Launch operations and procedures



Post Launch Assessment Report (PLAR)

Deliverables: Report only

- The PLAR is a discussion and analysis of your final competition flight.
- Should be about 5-15 pages in length.



ALL requirements for what to include in your team's milestone packages can be found in the NASA SL Handbook



Milestone Review Q&A Sessions



Milestone Review Q&A sessions will be held 4 times per activity year

- Include crucial information for successfully writing milestone reports
- Provide an opportunity for students to ask clarification questions

Timeline:

Kick-Off & PDR Q&A Session – (early October)

CDR Q&A Session (late November, following PDRs)

FRR Q&A Session (late January, following CDRs)

Launch Week Q&A Session (late March, following FRRs)

We **STRONGLY** recommended that SLI teams attend ALL Q&A Sessions





Questions?



