

Design Review Expectations

Preliminary Design Review:

The PDR is an opportunity for you to obtain valuable, actionable feedback on your project. To get the most benefit from the review, it is crucial that all project design items are prepared in advance. There are several required items that must be included in your presentation. Take the time to rehearse your presentation in advance. You must have: 1) a properly formatted brochure with a QR code linked to all current digital records, 2) a presentation format (trifold board or poster). It should provide information on the following: (Header on Presentation should include: School, teacher name, Team #- NASA project name and Team project name.)

1. *Problem Statement/Description* - Identify and describe the specific criteria for and constraints of the project design (these specific criteria and constraints are defined by the requesting NASA project).
2. *Research* – This is a very important step. Do not assume that you know exactly what you are going to design until you have researched the project. Include a reference list of all your resources. (reputable resources)
3. *Prototype design* - Show how design ideas have gone from concept #1 to final preliminary concept design. Show this visually with a written summary of the changes (drawings, CAD files, photographs, and other documentation). Make sure designs are well drawn with measurements on the drawing.
 - 3a - If you have a larger assembly, show sub-assemblies and separate component parts.
 - 3b - List and describe the materials that you will use/ have used in the prototype and why you chose those materials. Materials that would be more “space like for M2M missions” are not expected as they may be more expensive. If you have represented a particular material, make sure to state what material you are hoping to use.*Prototype* – The PDR prototype should have a 70% complete design with prototype aspects. Less expensive materials should be used so that you can “show” your design concept. 3D renderings will help offset prototype proofs.
 - 3c- 2 min video of your prototype and 2 min video of your presentation
4. Website or google site (optional) for your project or digital engineering notebook.

Critical Design Review (CDR) Expectations:

The CDR is like a final exam. You are expected to present a fully functional prototype and have evidence that it performs the tasks it is designed to complete. You should have evidence of reproducible testing that demonstrates how it functions according to project standards. To get the most benefit from the review, it is crucial that all project design items are prepared in advance. You must have: 1) a properly formatted brochure with a QR code linked to all your digital records. Ensure you have enough copies for the duration of the review day; 2) a presentation format (trifold board, poster). It should provide information on the following:

1. *All information and data* from the Preliminary Design Review (PDR). This time includes an annotated bibliography of the articles you are basing your design on. (reputable sources)
2. *Prototype*: A fully functional prototype along with 3D renderings (if possible). Prototypes should be 90-95% complete with only some minor tweaks needed if selected to attend the Final Design Showcase (FDS) in Houston.
 - 2a- New 3 minute video of prototype and new 3 minute video of your presentation
3. *Testing Data*: It should be present for all components and whole system. This data should be clear and detailed. Any changes made to design based on testing should be shown either in prototype or by design drawings.

Optional Binder Information for Design Reviews

Rationale: In an effort to offer a physical, organized view of complex information to judges and reviewers, the binder can go deeper into the subject matter for someone to review that information at their own pace. The binder creates a professional impression which shows the team's organization. It facilitates the audience's engagement with the content, especially if they are not as well versed in the content or project. In addition, it allows the speakers to stay on track with their presentation. The physical binder can also reduce potential Wi-Fi or technical issues that may occur.

Possible components for PDR:

- Initial research sources (list of resources and how it influenced the design)
- Additional pictures, graphics, CAD drawings (include drawing descriptions and/or labels)
- Preliminary testing data

Possible components for CDR:

- Complete annotated bibliography
- Additional pictures, graphics, CAD drawings with caption and/or labels
- Full testing data with results
 - May include testing methodology
- Key ideas or takeaways regarding the prototype (e.g., standout components, materials, cost breakdown, innovations, off-the-shelf products to be used in design, etc.)
- And additional supplementary information that would deepen the audience's understanding of the project and prototype