School Year Plan and Layout for Health and Biomedical Science

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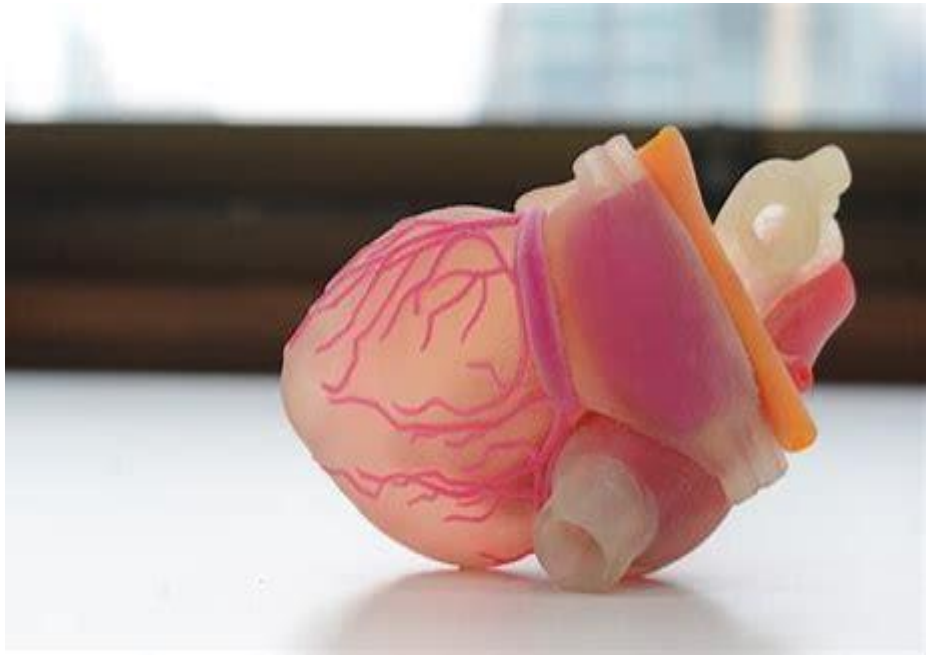
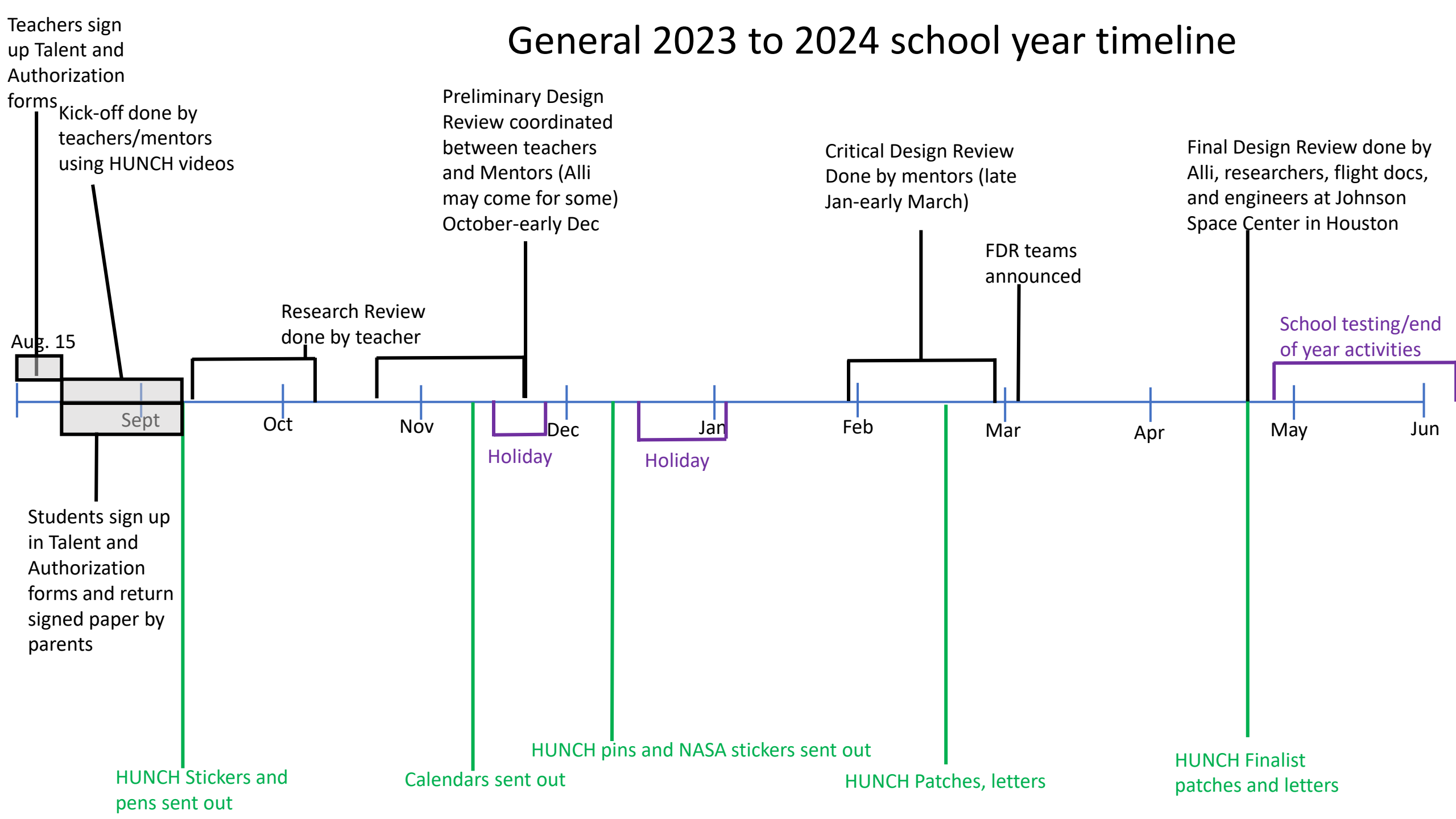
Goals for NASA HUNCH Health and Biomedical Science

- Bringing exciting new ideas to Human Research Program (HRP) and NASA Flight doctors.
- Creating an excitement for health, biomedical science and how it is needed for future long duration space missions.
- Brain storming solutions to design concepts that students construct for study and presentations.
- Presenting and clarifying their ideas to a group(s) of knowledgeable individuals.
- Following requirements and constraints while having freedom to explore unique solutions.
- Understanding the unique environment these solutions would be used in –primarily micro-G , or reduced G environments.
- Dressing for success at design reviews.

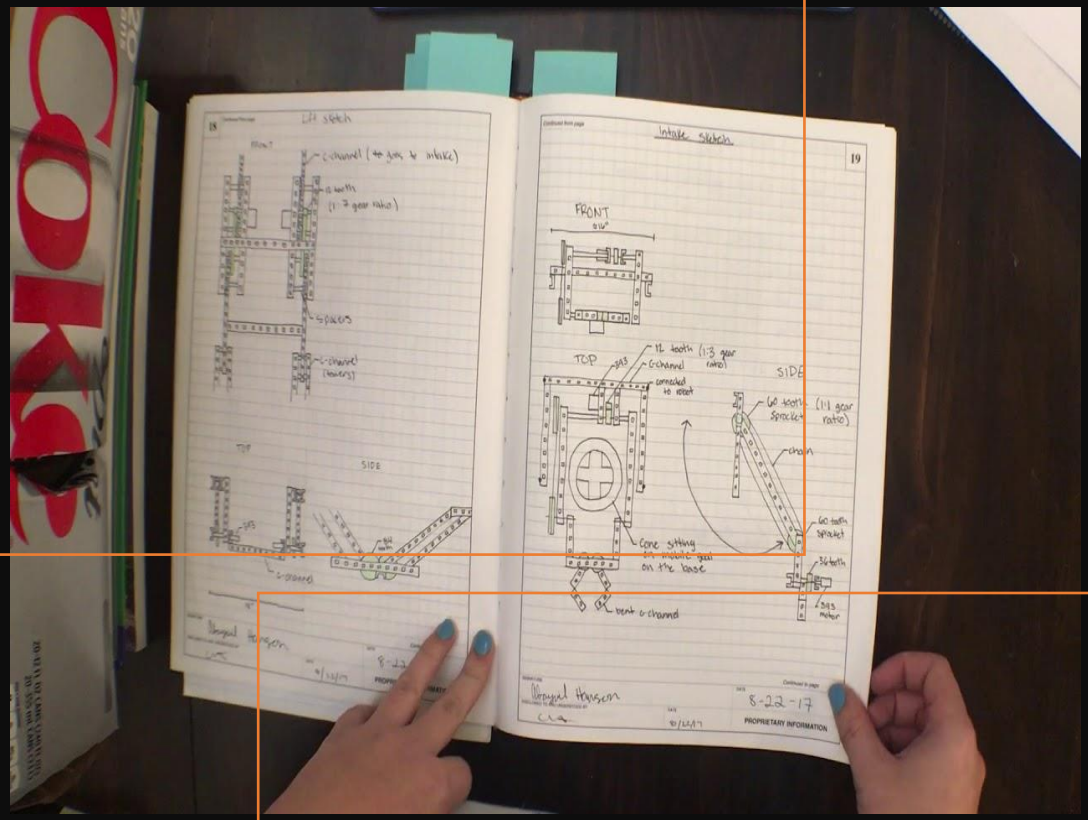


General 2023 to 2024 school year timeline



Design/Solution Notebook/ Design PowerPoint

- Its a good idea to use either a Design-Solution Notebook and/or the Design PowerPoint that is on the HUNCH page. This gives the teacher something to track and grade for each student or team. Design notebooks are a standard for documentation and organizing thoughts and ideas. This is an important tool for professionals and is a great tool to learn. The power point is a digital format that can be saved and viewed as the teacher needs. It has suggestions of what can go on each page and helps the students see what information needs to be saved.



Score Sheet for Health and Biomedical Projects—100 points

- Presentation—
  - Concise description of project
    - Virtual presentation—
      - PowerPoint style presentation—short and informative
    - Face to Face presentation—
      - Tri-fold presentation board—concise and informative
    - Brochure– easy to read, shows main ideas and results
  - Whole team talks
  - Team answers questions well
  - Good Knowledge of constraints and environment
  - Speaks clearly
- Prototype—
  - Functional/non-functional
  - Simple/complicated
  - Innovative ideas ----1.,2., 3., …
  - Clean design (looks more finished)
  - Testing Data--Different tests—1., 2., 3., ….
- Brochure--
  - Name, school, teacher
  - Pictures of prototype or science experiment
  - CAD drawing(s) of prototype- or sketches
  - Description of operation
  - QR code/ link to video of operation of prototype, testing data

		Research Stage		PDR		CDR
Presentation						
Discussion		20		10		10
Trifold/power point		0		5		5
Brochure		0		5		5
Research		50		20		10
Design		20		30		15
Prototype		5		25		40
Testing and data		5		5		25
Total		100		100		100

Notice how the emphasis on the components change as the project advances. This is expected to be an internal scoring system for HUNCH and the final scores are not expected to be available to the teachers or students. Teachers are encouraged to make the grading scale fit the needs of their classroom grading system.

Rubric Helpful Tips

- The reason for the rubric is based off of teacher and student requests for a clearer understanding of how we at HUNCH rate student presentations for PDR and CDR
- Please understand that there is no single way of rating projects that are often very dissimilar to each other. So the rubric should be used as a GUIDE for your presentations.
- The Research Review was added this year based on feedback that students do not have a lot of experience presenting scientific information. It is also meant as a way for teachers to gauge the amount of research students have done for their projects.
- PLEASE NOTE - the number one problem we at HUNCH have found during
- PDRs is that students have not spent a serious amount of time deeply researching their project AND/OR micro-gravity and its potential problems. The research review is meant as a way of emphasizing the need of research in the design and prototyping process.
- It is HIGHLY encouraged that the Research Reviews should be peer reviewed along with being teacher reviewed. This should give students a much deeper understanding of potential problems and allow them to hear other student's thinking about the space environment.

- Teachers may use the Research Review as a grading opportunity but should avoid using the rubric as a hard grading “device.” Please create your own process and standards for grading. The rubric should only be used as a general guide.
- Even though the “score” for each review totals “100” this is only a rough estimate of a weighting system we use for projects.
- “Score” in educational terms could be viewed a “weighting value” of importance of that topic.
- For example: a “20 for ‘discussion’ under Research Stage means that whatever grade you give a team for ‘discussion’ is worth 20% out of a total weight of 100%
- Another example: getting a perfect grade(whatever that is for your system) for building a prototype(a weight/score of 5) during the Research Stage is not going to worth as much during that stage as an average grade for your showing off your actual research(a weight/score of 50)
- If a topic has no score for a specific review it means it most likely has a minimal impact in an overall review of a project.
- We suggest a 4 point “grading scale be used for each topic pointed out in the Design Review chart (Presentation, Research, Design,etc.) Where most students should be aiming at getting a “3” or “Meeting Expectations.” Those expectations should be determined by the teacher in an effort to connect class standards to HUNCH.
- If there is confusion about the chart, the weighting system or how to integrate them into your class, please contact your mentor.

Project Brochure

This is a concise brochure your team should develop as a marketing tool used to sell your idea. It will serve to remind anyone who takes it home what a great idea they saw from your team. Please keep it to a one sided piece of paper. This will be handed out by your team to people who come to see your idea. There needs to be at least one for the reviewers to help them remember your project. The brochure should remind the reviewer in a glance of what your team did and said.

- Project Name, High School Name, Teacher Name, Student names on the team, Picture of team (without masks if possible)
- Description of the main features of your design.
- Include a CAD drawing of your design (isometric if possible) – or a sketch of your design
- Photos of your prototype or science experiment
- QR code for link to videos of your testing and the operating prototype—simple, short videos (no music or special effects)
- Can be arranged into any format your team prefers—tri-fold, bi-fold, open page– one sided

Plan on making updates to your brochure as the prototype or science experiment improves.

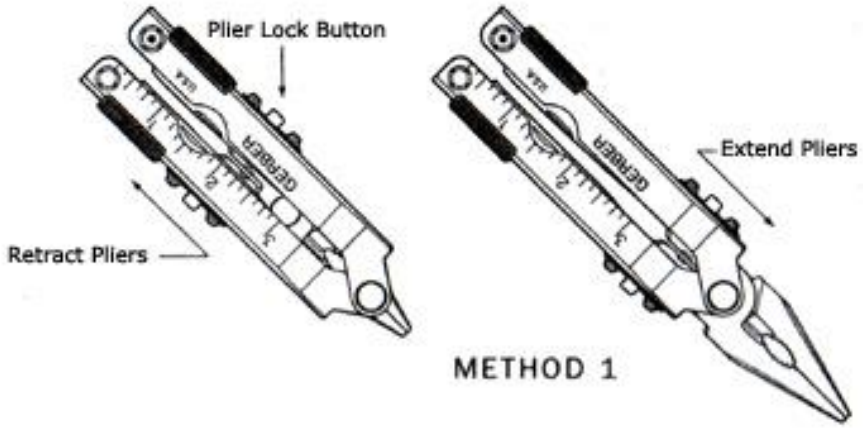
Multi-Tool

Genius High School
Ms. Amazinglysmart
Bob Coolio, Alli Awesome, Mike Mechanic

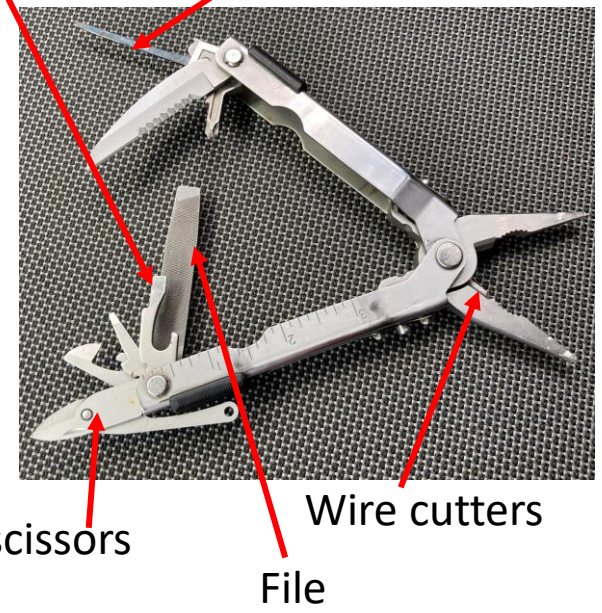
The main features of this Multi-Tool is that it has all the tools that I use on a daily basis and it collapses down to the small, compact form that fits on my belt. It is made of stainless steel and doesn't rust but is still magnetic enough so it will work with other magnetic tools. It contains 18 different tools as well as the ability to add bits to the Phillips head screw driver and blades to the saw blade holder.

Sample Brochure

The variety of tools is important. The scissors are sharp and a good size that allows cutting many different materials. The file is double sided and allows for filing harder steel on one side and softer materials on the other side. The handle is rounded to allow for a good firm grip when pulling with the pliers or cutting soft metal. All the tools lock into place and only fold back into the handle when the lock is released.



Link to video and testing data



Project Tri Fold Display Board

Each team should make a Project display board. A picture is worth a thousand words and a few good pictures of your idea will help people see why your prototype is the right answer to the problem.

A good Tri-fold display board will save you from talking and to give you pictures to point to. It will also attract people to your team's work.

Your Tri-fold needs to contain:

- Project title
- Problem you are solving
- Members of team, school, teacher
- CAD drawings of your prototype – Or sketches
- Any commercially available products you are using to inspire your design
- Pictures of your prototype (not as important if you have your prototype but critical if you prototype is lost or damaged before you can show it)
- Results and photos of any testing
- QR code for link to videos of your testing and the operating prototype
- Progression of your prototypes as you make improvements.

This will need to be updated for the Critical Design Review

Sample Project Tri-Fold for face to face presentations

Use a Science Faire Presentation Board (your choice of color)

Problem we are solving:

Similar Products we have examined

Why they didn't fit our need

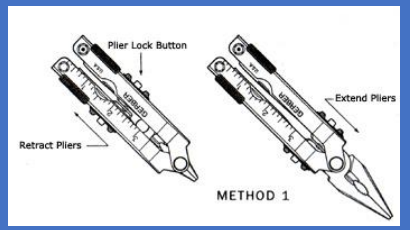
Multi-Tool

Genius High School

Ms. Amazinglysmart

Bob Coolio, Alli Awesome, Mike Mechanic

Problems we solved while developing our prototype



Link to video of prototype working and testing

Progression of the prototype

Materials we expect to use on the final design

Testing and Data

Next Steps

Sample Project PowerPoint for virtual presentations

Each team should make a Project PowerPoint. A picture is worth a thousand words and a few good pictures and videos of your idea will help people see why your prototype is the right answer to the problem.

A good PowerPoint will save you from talking and to give you pictures and video to point to and talk about.

Your PowerPoint needs to contain:

- Project title
- Members of team, school, teacher
- Problem you are solving
- CAD drawings of your prototype – or sketches
- Pictures or reference to any commercially available products you are using to inspire your design
- Pictures of your prototype (not as important if you have your prototype but critical if you prototype is lost or damaged before you can show it)
- Results and photos/videos of any testing
- Progression of your prototypes as you make improvements.
- Keep it short and simple
- Should include similar information as on the Tri-Fold
- No paragraphs

This will need to be updated for the Critical Design Review

Final Design Review Presentation:

- Teams at the Critical Design Reviews from around the country with exceptional designs, prototypes, presentations and testing will be invited to NASA Johnson Space Center in Houston Texas to present their projects and prototypes in an open venue, science fair style format for an afternoon. NASA Scientists, Flight doctors, Engineers and Astronauts will wander among the teams as the students present to whomever stops and enquires about their project. The general public of Space Center Houston patrons will also be able to stop and ask questions of the students. Some of these people may be from other countries and even other interested scientists or engineers.
- By being a finalist means you are a 'winner'. Part of the goal for HUNCH is to is to allow student ideas to be presented to professional scientists, doctors, and engineers where they can be evaluated. This is like real science or engineering. Ideas from some teams may be merged with other teams to make a final prototype. Some projects may not move on because requirements have changed or the project is no longer needed but all the ideas from students are kept. HUNCH does not forget projects and holds all the student data to be shared when interested scientists or engineers ask questions and have renewed interest. Often projects are revisited when the same problem comes up again or problems overlap into another.
- After the Final Design Review, each team member will receive a letter of recommendation from NASA HUNCH that the students will be able to use as they enter colleges, internships and careers that describes many of the accomplishments the teams have made during their project design experience. We want people to know the hard work that has been done.