Engineering Project 12-Week Timetable

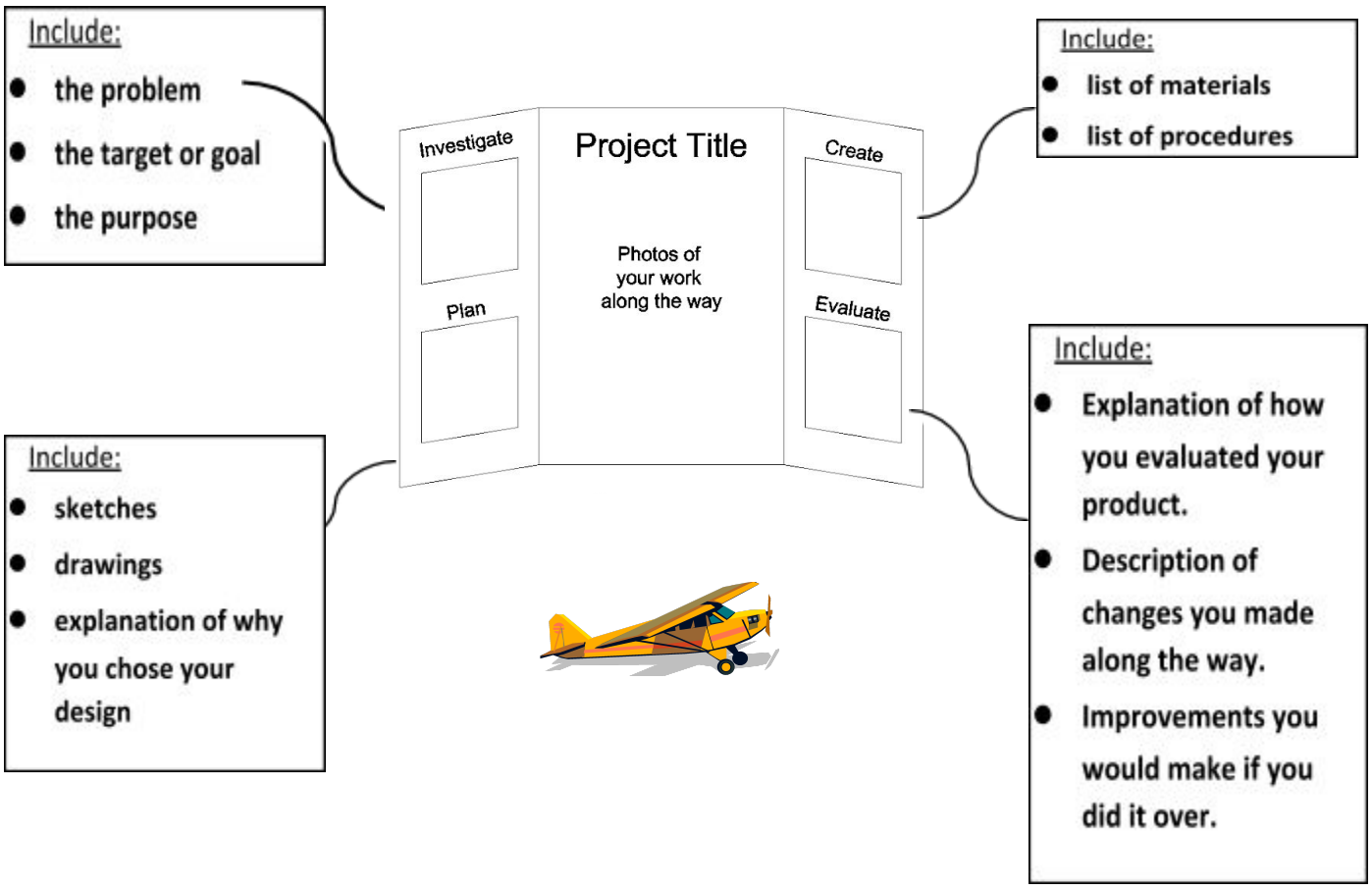
Place a Check if Completed	Timeline	Suggested Tasks
	Jan. 3-Jan. 15 ***Checkpoint 1 Due Date: January 15th***	• Choose a topic/problem or a need to investigate. • Make a list of things you will need to know in order to solve the problem. • Make a list of resources. (Use the library, websites, experts in the field, etc.) • ***Checkpoint 1: Students cannot move on to the next step until their teacher has approved the topic.***
	January 16-Feb. 3 ***Checkpoint 2 Due Date: Feb 4***	• Create a conceptual design (preliminary sketches and evaluate materials) • Make a decision about which concept you will go with. • ***Checkpoint 2: Students cannot move on to the next step until their teacher has approved the concept.***
	Feb 4 -Feb 16	• Develop a detailed design plan (production drawings and building a prototype)
	February 16-March 2nd	• Test and evaluate your design. • Plan the layout of the display board. • Begin typing the information about the design that will be included on the display board. (See the attached list for what should be included on board.) • Construct "final copies" of written work, diagrams, etc. • Prepare the signs, titles and labels for the display board. • Decide what other materials you should include in your display including your design product. (These items can be placed in front of your board.) • Proofread all of your work. • Mount all information including; titles, diagrams, pictures and aspects of your experiment, on your display board. • Practice your responses to the oral discussion questions with a friend or family member.
	March 2-March 12th	• Setup display at home and check for any flaws. • While standing in front of your display, practice your responses to the oral discussion questions with a friend or family member.
	March 12th	• Carefully bring your display to LMK on March 12th at 2:40PM.. • Return to LMK at 6pm with family and friends. • Don't forget to dress professionally and be prepared to answer questions about your project.

Materials Budget

	Item	Amount Needed	Cost of Item
Experiment Materials			
Display Materials	Tri-Fold Display Board	1	No cost
Total Costs (This cannot be more than $15.00 unless otherwise approved by your teacher.)			

Engineering Presentation Display Board Guide

Use the board diagram below to ensure you include all of the main parts of the project when designing your display board. Also refer to the rubric to check your understanding on how your board will be judged.



Display your product with your board!!!

Louis M. Klein Middle School
Science and Engineering Fair

Borrowing Materials Form

Student Name_____ Homebase Section_____

Science/Technology Teacher_____

Materials Borrowed:

_____
_____
_____
_____
_____

Materials to be returned by_____.

Student Signature_____ Date_____

The Engineering Design Cycle Reference Sheet

The 6 Steps in the Design Cycle

1. Identifying Needs

Develop a design brief!

Identify the problem.

- Why are you designing this?
- Who are you designing for?

2. Researching

- What will determine the success or failure of your design?

3. Generating Ideas

Brainstorm!

Generate many quick ideas in sketch form.

4. Developing a solution

Choose the idea that best solves your problem.

Refine your idea, making it the best plan possible!

Create a list of materials you will need. ($15 maximum)

Develop a list of procedures necessary to create your product.

- What tools will you need?
- Do you know how to use them safely?
- Will you need assistance from an adult?

5. Realizing the solution

Build a product from your idea.

Use appropriate materials and tools. Always ask before taking!

Practice safe work habits.

Ask an adult for help!

6. Evaluating

Does your product solve the problem you identified?

- ✓ Why are you designing this?
- ✓ Does it work for the target user?
- ✓ Is it safe to build, use, store, and dispose of?

Can you improve anything?

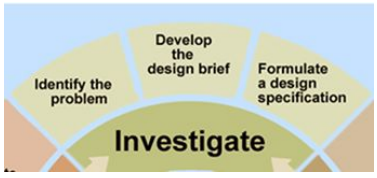
Harrison Central School District

Engineering Project – Design Brief

THE DESIGN CHALLENGE:

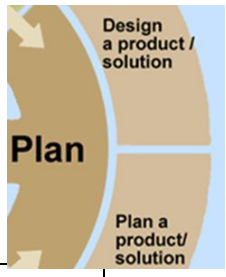
Designers:

1. INVESTIGATE



- In your own words describe the problem and specifications.
- What are you being challenged to do?

2. PLAN

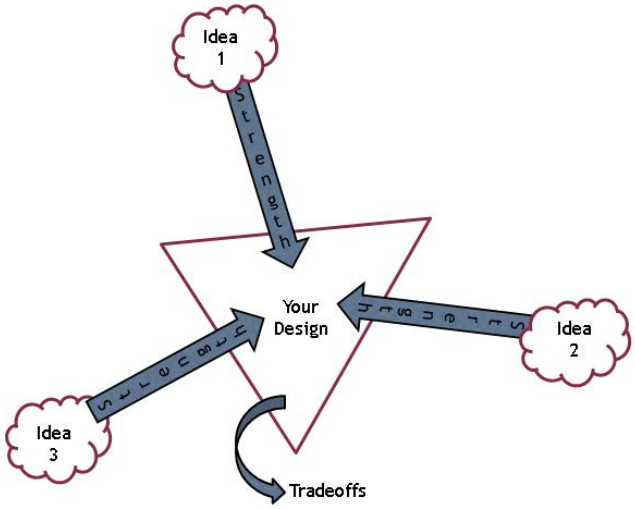


- Research possible ideas and solutions. Use the internet, books, magazines, & people!
- Draw **3 sketches** of possible design solutions. **Attach** the sketches to the design brief.
- What are the impacts of your design (refer to the **3 sketches)** on society, the economy, and the environment? Fill in your ideas.

SKETCH	POSITIVE IMPACTS	NEGATIVE IMPACTS
First sketch		
Second sketch		
Third sketch		

- **Make a FINAL DRAWING.**

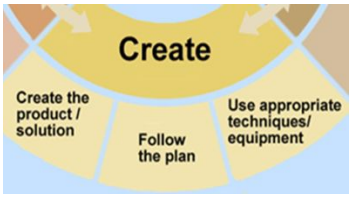
Plan to combine the positive impacts and strengths of each to create your own design.
Your design should include accurate measurements and be to scale. This will allow you to build your prototype. Attach the drawings to the back of your design brief.



3. CREATE

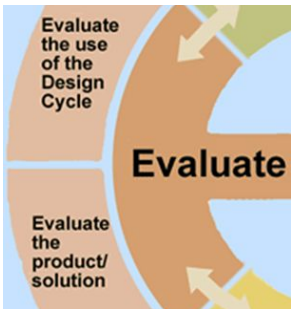
How did you use Technology to the seven resources of build your prototype safely?

1. **TIME**: (Start Date and End Date)
2. **INFORMATION**: (From where?)
3. **CAPITAL**: (How much do things cost?)
4. **TOOLS/MACHINES**: (Which ones?)



5. **ENERGY**: (What types?)
6. **MATERIALS**: (Which ones?)
7. **PEOPLE**: (Who?)

4. EVALUATE



- Does the product meet the specifications identified in Step 1? How?
- If you were to redesign and improve your idea, what changes would you make? Why?
- What are the tradeoffs of your improved design?
- Reflect. Write a paragraph describing your use of the design process. Which steps worked well? Which steps were more difficult?

Grades 6 - 8 Science & Technology Fair Rubric for **Engineering Projects**

	1	2	3
Followed Design Process	No evidence of the design process is shown. Product is incomplete.	Some steps of the design process are evident. The product is complete.	All steps of the Design Process are evident in the final product. Student investigated a problem; planned a solution; created a product; and evaluated their work.
Originality and Creativity	Design is a replica of another's work.	Design is creative, yet based on another's ideas. Some originality is evident.	Originality is evident. Design is unique and very creative.
Final Product	Product is incomplete or non- functioning.	Product is complete and functions correctly.	Product is complete and functions correctly. It is also well crafted. All joinery is neat and clean. Materials are well finished. A high level of skill is evident.
Display Board	Display board is not organized and neat, causing confusion for the readers.	Display board is somewhat unorganized and untidy, causing some confusion for the readers	Display board is well-organized and neat, so that readers may follow the work and interpret its meaning.

Preparing for **Science/Engineering Fair Presenting**— Practice Makes Perfect!

If you can communicate your science/engineering fair project well, audience members will understand your project better!

- Write up a short "speech" (about 2–5 minutes long) summarizing your science/tech fair project. You will give this speech when you first meet the judges. (Remember to talk about why your project turns out the way it does.)
- Practice explaining your science/tech fair project to others and pretend they are judges.
- Practice explaining your science/tech fair project in simple terms so everyone can understand it.

Presenting Yourself during the science/engineering fair-Be Professional!

- Always dress nicely for the science fair presenting.
- Make good use of your display board. Point to diagrams and graphs when you are discussing them.
- Always be positive and enthusiastic!
- Be confident with your answers; do not mumble.
- If you have no idea what the audience is asking, or do not know the answer to their question, it is okay to say "I do not know."
- Treat each person who visits you respectfully.
- *After* the science/tech fair, ask for feedback from the judges to improve your project.

Sample Questions

1. Where did you get this idea?
2. Are there any famous scientists/engineers that inspired you to research this topic?
3. How long did it take you to run the experiment/do the design?
4. Did you run into any problems while doing your experiment/design? What did you do to overcome them?
5. Did anyone help you? What did they do to help?
6. What does your data tell you?
7. What are the three most interesting things you learned when doing this project?
8. Did you get the results you expected?
9. What would you do differently next time?
10. Why was this research important?
11. What further research do you plan on doing, or what could be done?
12. What would you do next?
13. Do you have any questions for me?