

Engineering Design and Invention projects

Choosing Your Engineering Question

Once you've selected a topic and narrowed your search to a single problem to work on, identify possible solutions, and then plan to develop the best one based on your criteria and constraints.

Examples of Engineering Questions:

How can you redesign a sandbag to better protect homes during a flood?

What can you do with a swim cap to optimize its ability to decrease drag in water?

What is the best propeller design for a wind generator?

Engineering projects do not need to culminate in a final working model or prototype as long as you provide detail in your future goals on how you plan to troubleshoot or improve your design.

If you are still unsure whether your project is a science investigation, engineering design and invention computer science design and invention, please ask a teacher or parent for help.

Engineering Design and Invention Project Checklist

- _____ **Pick a Topic:** Define a need or “How can I make this better?” Ideas should come from things in your areas of interest. What is going on in the world that you would like to change?

- _____ **(Optional) Set up and Keep a Project Notebook:** During the design and testing process, keep detailed notes of each and every test in a Project Notebook.

- _____ **Research Your Topic:** Do background research and search the literature to see what has already been done or what products already exist that fill a similar need. What makes them good and what makes them weak? Use a minimum of 3-5 resources.

- _____ **Submit Project Proposal:** Submit your project proposal. If safety review is required be sure to indicate so on your project proposal form.

- _____ **Organize:** Organize everything you have learned about your topic. At this point, you should narrow your thinking by focusing on a particular idea.

- _____ **Make a Time Line:** Choose a project that not only interests you, but can be done in the amount of time you have. Develop a time line to manage your time efficiently.

- _____ **Develop or establish design criteria:** There could be more than one, depending on your topic. For example, what is your product supposed to do? What constraints exist in the design (i.e. size, weight, materials, etc.)?

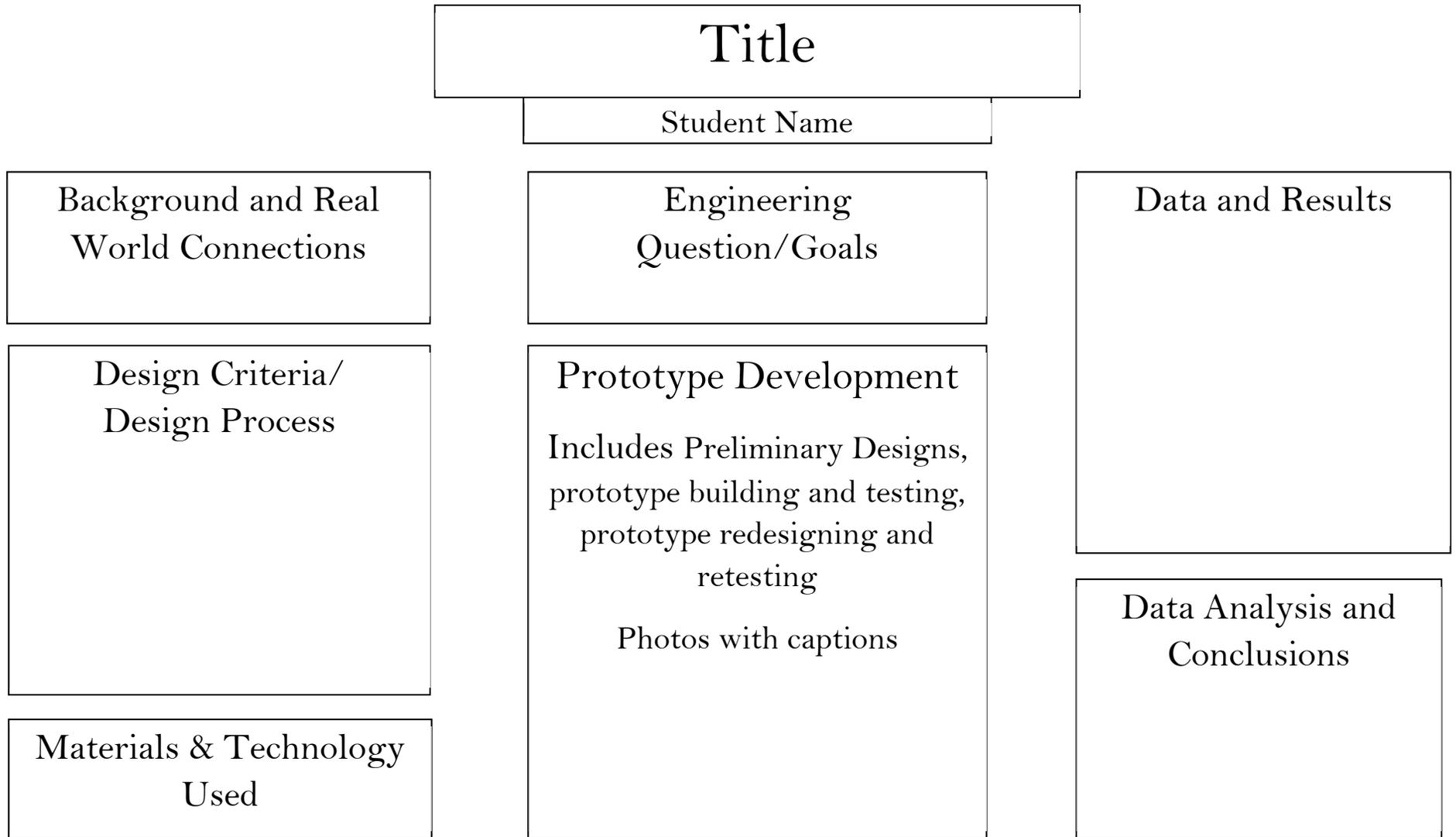
- _____ **Prepare Preliminary Designs:** Prepare preliminary designs and a materials list. Consider costs, manufacturing and user requirements.

- _____ **Build and Test Your Prototype or code and test software:** Build a test prototype of your best design or code and test software based on your design. Consider reliability, repair and servicing.

- _____ **Retest and Redesign:** Retest and redesign as necessary. Run product testing.

- _____ **Prepare to Present your Project:** Construct a display board. Practice talking about your project to friends, family, and other supportive adults.

Display Board example for Engineering Design and Invention Projects



In Front of Display Board on Table: Project Notebook and any other materials you feel would be useful to explain and show how you ran and/or created your project.