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## STEM/Engineering Fair Paperwork

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These are instruction pages that can be printed for students completing an engineering project.

**ALL SCIENCE FAIR PROJECTS REQUIRE PAPERWORK, TO ENSURE YOU STAY SAFE!**

You'll find the forms you need here:

1. CUSEF STEM: <https://cusef.byu.edu/forms/>

**NAME:** \_\_\_\_\_

## **PICKING A TOPIC**

Science Buddies (<https://www.sciencebuddies.org/>) is a great place for beginning ideas, but if you find an idea on Science Buddies you should try to **change it to make it your own.**

Still struggling? Write down a list of 5 things you like to do, think about project ideas for each. Research your ideas online or at a library.

- Does someone around you have **EXPERTISE** in something you're interested in?
- Sometimes **Teachers or Professors** will let you interview and ask questions about a subject. (If you're lucky you might work in their lab.)
- What's *happening* in your area? Is there anything that needs to be fixed, made, built or improved?

★ **Topic Ideas:**



--Make sure that your engineering project is something needed or improved, we don't want to see something that's already been done, nor do we want to see you taking apart a clock, or trying to rebuild something you broke.

## DEFINE A NEED:

Engineers define a need instead of writing a project question/hypothesis. Though it is better to have a project question and a need statement, some projects will only have a need statement:

★ **--Project Questions:** What are you going to solve or improve? It can be as simple as 'Will changing the triangle shape make a stronger bridge?'

★ **--Need Statement:** Clearly define what you will improve and your expected audience.  
'This engineering project will improve  
\_(design/item)\_\_\_\_\_ for \_\_(audience)  
\_\_\_\_\_.'

# RESEARCH/REFERENCES

Research a minimum of 4 references. (Try to not use websites ending in .com) Websites ending in .edu, .org., websites for students, or college/university websites are wonderful. You can even use a video on youtube as a reference (just make sure it has good information and that you have permission to watch it.)

-- Research your engineering need and how it will help your audience, or find an article related to your topic or project question.

--Print the references you find online and **highlight** the most important parts.

★ **Research:** Use this to guide the writing of your research paragraph:

things I learned from reference 1.	3 things I learned from reference 2.
3 things I learned from reference 3.	3 things I learned from reference 4.

★ 1. Tell three things you learned about your design?

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2. What improvements are you trying to accomplish?

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3. Tell three things you learned about your audience, who will this help?

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4. Did you find any article related to your study? What did you learn?

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## **REFERENCES**

--References go at the very end of your STEM Fair project, but are easier to put together while you do your research.

I suggest that you use a reference generator, such as [BibMe](http://www.bibme.org/) (<http://www.bibme.org/>) to create your **full references**. APA style is generally used for Science Fair. Create your references page while you complete your research, it will be faster.

Here's the basic format:

Author Last Name, First Name Initial. (Date) Title of Article. Where Published. Publisher.  
Retrieved from: URL

-- Direct statements or quotes from sources require an in-text citation. They usually go at the end of the sentence or statement you used. Example: (Author Last Name, Year).

**In-text citation** look like this:

With a bit of work, the STEM Fair can be fun(Provo.edu, 2020).

★ **References: (Print the references you made online and staple/tape them here.)**

# DESIGN INSTRUCTIONS

A detailed set of instructions telling others how to do the project. *Step 1...2...3...4...up to as many steps as you need.* I suggest that you write down all the procedures then give the instructions and a highlighter to a parent or guardian, any steps that don't make sense, or need more instruction should be highlighted and revised.

--Keep in mind how easy it will be for others to use your final product.

--Try to write your procedures without using any personal pronouns: I, me, you, us, we, them--  
etc.

(add more numbers as needed.)

★ 1.

2.

3.

# PRELIMINARY DESIGN

Drawings, Pictures, plans for your first design. Include a short materials list of all the things you need to complete your project. Think through your project-what will you use, then while doing the project add anything you missed.







# REBUILD AND RETEST

Your improved prototype! Build your item again, based on your design but with improvements.

★ Design, drawings, pictures, here:

## Answer the following:

★ 1. Does it work the way you expected?

★ 2. Is it better/worse than what has already been made, or what you made the first time?

★ 3. Is it easy to use? Who is meant to use this product-kids, adults, animals, plants?

★ 4. How can you improve this second design?

\*\*\*Most engineering projects will not have a data table/graph, if yours needs them look up the instructions for each in the Science Fair Student paperwork section.\*\*\*

★ **Conclusion:** Answer these questions in your conclusion, if the answers are well written then your conclusion will be complete. Do not give any one word answers to any question.

--Write your conclusion without using any personal pronouns: I, me, you, us, we, them-- etc.

1. What engineering steps did you use to complete this project?

2. How is this product/item better than what we already have available?

3. Explain your design, what makes it unique?

4. What would you do differently next time?

5. Did you make any mistakes or did you change anything to improve your project?

6. How is your project useful to others, society, the world?

