

Engineering Fair

Log Book

Inventor's Name: _____

Congratulations on embarking on an engineering adventure! We are excited to see the creative and useful ideas you will share at our Engineering Fair. This a big, but rewarding project that we hope will be a great challenge for you, but most importantly, a FUN adventure for your mind! Inventors need to be creative hard workers who don't give up when a problem arises. We know you are up to the challenge!

Consider Thomas Edison, inventor of the light bulb. Edison actually went through over ten thousand prototypes before getting his design right! He became famous for saying "I have not failed 10,000 times. I have not failed once. I have succeeded in proving that those 10,000 ways will not work. When I have eliminated the ways that will not work, I will find the way that will work." We can learn from our failures as much as our successes, so whatever happens on your invention journey, DON'T GIVE UP!

Your completed project will include 3 parts. Components for each part are listed below. Check to make sure that you have completed each part before turning in your project. Good Luck!

Engineering Fair Log Book	Display Board *	Product Presentation
Make sure that you have completed each page in the log book before you are finished.	Section 1: Purpose Section 2: Research Section 3: My Invention Section 4: Design & Building Process Section 5: Product Feedback Section 6: Reflection * Have an interesting or "catchy" product name or title. * Make sure your board is organized, neat, and eye-catching. * Keep in mind the use of pictures, colors, uniform print, balance, and spacing. * Judges like to know about your design process, so be sure to take photos while you work.	Your display should include a working prototype or model of your invention. Think about what you will say to the judges to present your invention in a clever way!

* See page 18 for specific information about what to include in each section on your display.

Name: _____ Data Collection Period: _____

Problem Finding

List 8 problems you observe or things that bug you this week! Be sure to list problems that might be solved WITH AN INVENTION. Survey other people to find out what bugs them too. You must include at least **FOUR** problems that YOU encounter this week. At least **TWO** of your ideas must come from other people you survey. Inventions can help the young, old, and everyone in between, so consider surveying people of varying ages. Some survey questions you might consider include:

- What problems do you encounter that you wish someone could create something to solve?
- What tasks, chores, or jobs do you dislike doing? How could they be made easier?
- What kind of invention might make your life easier?

	Problem	Observer
Ex	The seatbelt in my car rubs against the side of my neck when I am driving because I am shorter than most drivers. It really bugs me and is not safe!	Kaycie Rogers
1		
2		
3		
4		
5		
6		
7		
8		

Problem Selection

Does your invention idea have PROMISE? See if you can answer the questions below about your idea. If you can, you have an idea with PROMISE that might make a clever invention!

<u>My Invention Idea:</u>		
P	Problem Solving?	What problem would your invention help solve or improve?
R	Realistic?	How much of the project can you do independently? What help would you need from adults?
O	Original?	Do any products similar to this one currently exist? If so, what are they?
M	Manageable?	What are the things that might cause problems when trying to build this invention? Are they manageable?
I	Inexpensive?	What materials would you need to create this invention? About how much would it cost to build your design?
S	Sell-able?	What would make people want to buy this product? Who would your "market" be?
E	Exciting?	What makes your invention a "must-have" item?

Purpose

- Tell the name of your invention and write a brief introduction of the product.
Make it catchy and memorable. This is the FIRST IMPRESSION!
- Tell the problem or idea that led to the invention.
- Explain how your idea helps or solves this problem.
- Explain why the invention is useful.
- Who is the market for the invention? (Who will use it?)

Remember to be detailed and specific. Use the back of your page for more space.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Research Planning

List at least 3 key words or phrases that will help you complete an online search for products similar to your idea.

- _____
- _____
- _____

What types of stores or online retailers might sell a product similar to yours? List three online stores you might search for a similar product.

- _____
- _____
- _____

You must use at least **TWO** different sources to find information about products that may be similar to your idea. (Begin thinking about how you will make sure your design is different from similar products you find in your research.) We suggest using the "Google Patents" website as one of your sources. This site includes sketches and detailed notes about patented inventions. You may include more than two sources if you would like. (If you need additional space, feel free to write on the back of the pages in your logbook.)

Some websites you may want to try searching are:

homedepot.com	petsmart.com	sportsauthority.com
linensandthings.com	sharperimage.com	brookstone.com
sears.com	officedepot.com	amazon.com

Make notes of the information you find using the graphic organizers on pages 6 and 7. Then, use your notes to write a summary report on page 8 sharing what you learned about similar products. You should create a different paragraph for each source you include.

Research Notes (Source 1)

Reference (List the SPECIFIC website address.)	
Name of Product	
Describe the Product	
Explain how this product is similar to your invention. (You may think about the materials it is made of, its appearance, size, durability, cost, comfort, etc.)	
Additional Comments or Notes	

Research Notes (Source 2)

Reference (List the SPECIFIC website address.)	
Name of Product	
Describe the Product	
Explain how this product is similar to your invention. (You may think about the materials it is made of, its appearance, size, durability, cost, comfort, etc.)	
Additional Comments or Notes	

[illegible]

My Invention

- Describe your invention.
- Explain how to use it.

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Originality

Describe how your invention shows creativity and originality. How is your invention different or better than similar products you researched? For example, your invention might be different in shape, size, appearance, comfort, materials needed, durability (how long it will last), cost to manufacture, or how it is used. Convince us you have a one-of-a-kind idea!

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Prototype Illustration

Use the space provided below to draw your invention.

- Use as much of the space as possible to draw your design so that your illustration will be large and show detail.
- Make sure your drawing shows all parts, and each part is clearly labeled.
- Label the approximate dimensions (sizes) for each part.

(We will make a copy of your drawing for your display board, so please work neatly.)

Design Decisions

Explain the design decisions you made. (For example: The legs on my product are made of wooden dowel rods. I first tried using toothpicks, but I realized I needed a material that was sturdier.) The more the judges "see" your thinking through your descriptions, the more impressed they will be with your design work.

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Materials

List each item needed to build your invention. Use the back for more space, if needed.

Item	Size	Quantity	Price
Total Cost to Manufacture			

Based on the manufacturing cost, I would set my selling price at _____.

If I sold my product at the cost above, I would make the following profit:

Profit for 1 Item	Profit for 10 Items	Profit for 100 Items	Profit for 1,000 Items

Procedures

Explain how to build your invention. Write a step-by-step numbered list.

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Surveying Product Users

Create a survey to give product testers that will determine how effective your invention is. Create questions for each box. For questions that use a numbered response, write a description of what each number means (For example: 4 = "very easy to use;" 2 = challenging to use). Question 4 should allow for an open-ended response.

Invention: _____

Designed by: _____

Directions:

(1)	1	2	3	4	5
(2)	1	2	3	4	5
(3)	1	2	3	4	5
(4)					

Have at least 5 users try out your product and complete a survey. You can make a neat, typed copy of the survey, or we can make copies of your logbook page.

Organizing Survey Data

Compile Your Data. For each question with a numbered response, find the AVERAGE/MEAN score. Complete the chart below.

Question #	Total of Responses (Add the responses from all surveys for that question.)	Number of People Who Answered That Question	Average Rating (To find, complete the following equation: Total of Responses ÷ Number of People)

What other feedback did you get from your product users?

Product Conclusions

Think about the data you collected from your surveys. What can you conclude about your product based on the feedback? Make sure you have data to support your conclusions!

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Reflection

- Tell what you learned from this completing this project.
- What challenges or problems did you face?
- How did you solve problems while completing this project?
- What might you do differently or better if you continued to work on improving this project?

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Display Board

Use a tri-fold board to display information about your product.

SECTION 1 HEADING: PURPOSE

- Type information from page 4.

SECTION 2 HEADING: RESEARCH

- Type information from page 8.

SECTION 3 HEADING: MY INVENTION

- Type information from pages 9 and 10.
- Make a copy of your drawing from page 11 to post on your display.

SECTION 4 HEADING: DESIGN AND BUILDING PROCESS

- Type information from page 12.
- Type information from page 13 using the sub-heading "Materials."
- Type information from page 14 using the sub-heading "Procedures."

SECTION 5 HEADING: PRODUCT FEEDBACK

- Share your survey questions and the average response for each question (from page 16).
- Share other feedback you got from product testers (from page 16).
- Tell what you can conclude about your product based on the data you collected (from page 17).

SECTION 6 HEADING: REFLECTION

- Type information from page 18.

Make sure your display board looks pleasing to the eye. Keep in mind the use of pictures, colors, uniform print, balance, and spacing. Be sure to work neatly when you are cutting and gluing and make sure all items are glued straight. **DO NOT GLUE ANY ITEMS TO YOUR BOARD UNTIL YOU HAVE ARRANGED EVERYTHING!** Think about how you will lay out your information in a logical way.

Display Board

Make plan for your display board.

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Pitching Your Product

A pitch is a short presentation that encourages others to use or buy your product. Create a short pitch for the judges (approximately 30 seconds) that introduces your product.

Plan:

- Organize what you will say. Think about a catchy phrase or slogan that will make your product stand out among the crowd and make the judges remember your idea.

Practice:

- Practice your speech more than one time in front of friends, family members, or a mirror. Have someone video you so you can see what you look like when you are presenting. Practice speaking with confidence; using a strong, loud voice; and keeping eye contact with your audience. Feel free to point out special parts of your display that you want the judges to notice. Have your practice audience ask you questions like the judges might ask.

Present:

- Demonstrate your product for the judges. Be sure your presentation includes the following information:
 - o the name of your invention
 - o your name
 - o the problem or story that led to your idea
 - o how your invention solves the problem
 - o how your invention improves lives

(Feel free to add any other information you feel is important to share.)
Interact with your display board and invention model.