

The Story of Your Invention

Invention Log

What is an invention?

An invention is something new that enables us to solve a problem or do something better or easier.

The purpose of this Invention Log

All stories have an ending. In this case, the ending of what you are doing is your invention. But all stories also have a beginning and middle. The purpose of this Invention Log is to tell the entire story of your invention. In it, during every step you take in making your invention, you will record what you did, why you did it, and how you did it. This Invention Log is an important part of the invention process and is a complete and accurate record of the ideas, plans, and processes by which the invention was created. Invention Logs can be used by students to prove they came up with the idea and invention. Oftentimes, they are used as part of the patenting process.

How to use this Invention Log

The Invention Log is not a book report that is created after you are done. Rather, it is a diary that is continuously filled in as you work on your invention. Follow the steps of the invention process and fill out the various pages as you work on them. When you are done with a page, print your name and the date at the bottom. If you need extra space for any section, make copies of the Blank Page (Page 17) and use that for any purpose. Once you are done, put the pages in the order in which you did them and staple them to make a complete Invention Log. This log will also be used as part of the final presentation and needs to be filled in using complete sentences (except for things like a list of materials). Teams share one Invention Log and should attach signatures of all inventors.

The name of the invention: _____

The problem that it solves:

Statement of Originality

I promise that the ideas in this Invention Log are my own. (If a team, all should complete.)

Inventor Name(s): _____

Signature(s): _____

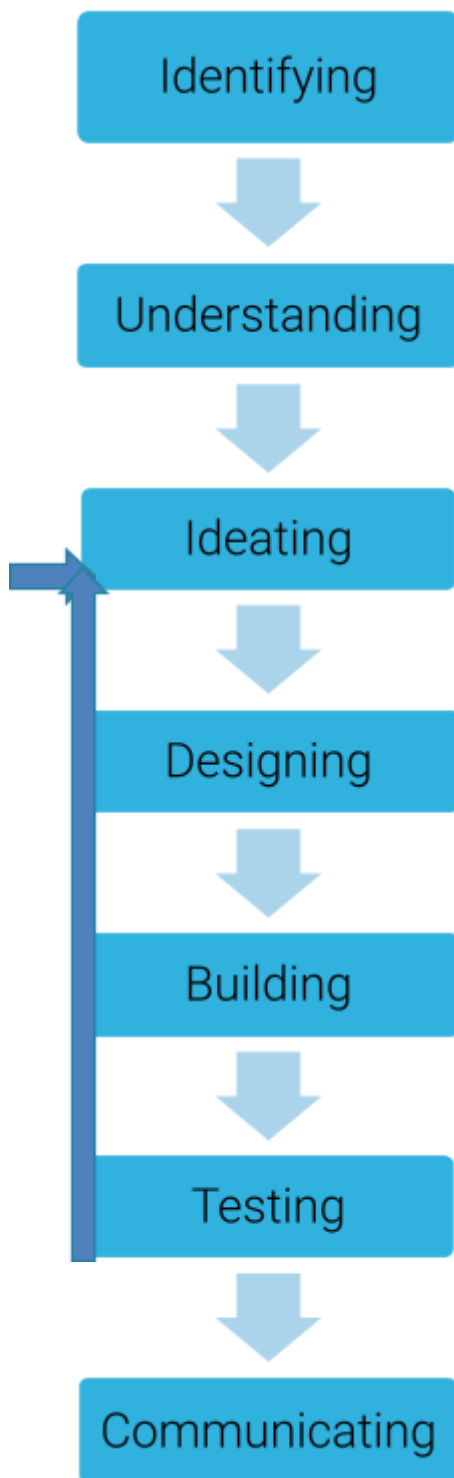
Date: _____

Grade: _____

School: _____

Town: _____

Invention Process Overview



Identifying a problem means brainstorming and using research to discover problems and who might have these problems. You might uncover these problems at home, at your school, with your sports team, listening to the news, or somewhere else entirely.

Understanding the problem means you know what is causing the problem and exactly what you want to happen when the problem is solved. The better you understand the problem, the better your solution will be.

Ideating means thinking about the problem: brainstorming and researching different ideas and options to solve the problem.

Designing means deciding what your invention solution will be made of, what it will look like, and how it will work.

Building means assembling your invention based on your solution design using the materials and the process you have decided to use.

Testing your solution is how you find what works and what doesn't. You will modify or change your design, build in those changes, and test the changes. Testing also includes an analysis of the pros and cons of the invention, its impact on society and the environment, its marketability, and its social value. You keep repeating this process until your invention or prototype works and works well.

Communicating means explaining the problem and your research, how your invention solution solves the problem, who might use your invention, your process in creating this invention, and how you might make it even better.

Terms to Explore

These are terms that have to do with inventing. Some of these terms are used in this Invention Log, and some may be terms that you will want to use to describe your process. Please read over these terms before you get started.

advertise – the act or practice of calling public attention to one's product, service, need, etc., especially by paid announcements in newspapers and magazines, over radio or television, in social media, on billboards, etc.

brainstorm – to produce an idea or way of solving a problem by holding a spontaneous group discussion or individual thinking session.

data collection – the process of gathering and measuring information of different variables, in a systematic way that helps one to answer research questions, test hypotheses, and evaluate outcomes.

design – to plan and make decisions about something that is being built or created. To create the plans, drawings, etc. that show how something will be made.

durable – able to withstand wear, pressure or damage.

engineer – people who invent, design, analyze, build, and test machines, systems, structures, and materials to fulfill objectives and requirements while considering the limitations imposed by practicality, regulation, safety, and cost.

entrepreneur – a person who organizes and operates a business or businesses, taking on greater than normal financial risks in order to do so.

experiment – a scientific procedure undertaken to make a discovery, test a hypothesis, or demonstrate a fact.

hypothesis – a proposed explanation using previous knowledge, but made on the basis of limited evidence; a starting point for further investigation.

improvements – the act or process of making something better; the quality of being better than before.

interview – a formal discussion to establish needs or requirements; a report or reproduction of information is obtained.

inventor – a person who invented a particular process or device or who invents things as an occupation.

invest – to put (money) to use, by purchase or expenditure, in something offering potential profitable returns.

market – to advertise and offer a product for sale; to present something in a particular way and make people want to buy the product.

marketable – able or fit to be sold or marketed; meets enough market needs to be able to be sold.

original – created directly and personally by a particular artist; not a copy or imitation.

operational – in or ready for use.

patent – a government authority or license conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention.

perseverance – continued effort to do or achieve something despite difficulties, failure, or opposition.

pitch – promotion by means of an argument and demonstration; a short verbal dialogue that tells the story and benefits of a product.

problem – a matter regarded as unwelcome or harmful and needing to be dealt with and overcome.

product – something that is made or grown to be sold or used.

profit – money that is made in a business, through investing, etc., after all the costs and expenses are paid; a financial gain.

profitable – yielding advantageous returns or results; yielding a financial profit or gain.

prototype – an original or first model of something from which other forms are copied or developed; an early version of a product that helps the inventor consider different options for design before finalizing a go-to-market design.

publication – the act or process of producing or printing a book, magazine, newspaper, etc. and making it available to the public.

research – the study of materials and sources in order to establish facts and reach new conclusions.

seek – to search for something or someone; ask for help to achieve something.

solution – something that is done to deal with a problem; something that solves a problem.

source – the point or place which something starts; a place, person, or thing from which something originates.

substantially – to a great or significant extent.

test – a procedure intended to establish the quality, performance, or reliability of something, especially before it is taken into widespread use.

testimonial – a written or spoken statement in which you say that you used a product or service and liked it.

Requirements and Restrictions

To participate in the STEMIE National Invention Convention and Entrepreneurship Expo (NICEE) in the Spring, there are certain restrictions and requirements.

- Your teacher must sign off on your solution/invention before you begin building your design.
- Remember that animals are not allowed at NICEE, so if your invention is for animals, you must demonstrate it in pictures or on a stuffed toy. Demonstrations/presentations may not include human beings or other living creatures.
- Your display board must be no wider than 24" with the 12" wings folded in.
- You must have a COMPLETED, SIGNED Invention Log with each page signed by you.
- Your prototype/invention should be no more than 2 feet high and 2 feet wide and be able to set on a table top.
- Your invention does not have to be a working model, but you need to be able to explain how it would work. If it can be operational, it should be.
- Wall outlet electricity (120 VAC) may NOT be used at NICEE. Battery powered devices are fine.
- Inventors may not use lighters, matches, candles or any other open flame or heat source nor any material or liquid considered combustible.
- Inventions may not contain biohazards or utilize any materials that are, or could become, dangerous.
- Other restrictions include: electric stun guns, martial arts weapons, guns, replica guns, ammunitions, fireworks, knives of any size, mace, pepper spray, razors, box cutters or balloons.
- If your invention cannot be actually demonstrated at NICEE due to issues with size, electricity, or hazardous materials, a video of the device in action can be shown.

Originality

It is very important that your solution is original and does not already exist or is substantially different from any other invention. These are great places to research to find out if your idea already exists:

- Libraries (ask a librarian for advice on where to look!)
- The internet (e.g., www.google.com, www.bing.com)
- Stores (e.g., www.amazon.com, www.bestbuy.com, www.walmart.com, www.target.com)
- Books about your topic(s) (look up at www.bn.com or www.amazon.com)
- Professionals in the industry (check out www.linkedin.com for possible people to interview)
- Trade/industry-specific publications (each industry has topical magazines and websites)
- United States Patent and Trademark Office (visit www.uspto.gov to search for patents and trademarks)
- Domain registrars (e.g., www.GoDaddy.com to see if your product name .com is taken)

The Steps You Will Take

As you work on your invention, follow these steps and check them off as you complete them. Don't write your ideas here – use the appropriate space in the following pages to complete each of the sections.

1. What problem are you trying to solve?
2. What is the result you are trying to achieve?
3. What are some possible solutions and which one did you choose to do?
4. Has this solution been done before?
5. Make a model (drawing) of the invention.
6. What problems might you encounter with this design?
7. How will you fix those problems?
8. Repeat steps 5 to 7 until you have a design that you think will work.
9. What parts and materials will you need to make the invention?
10. Where will you get those parts and materials?
11. What additional skills will you need to make the invention?
12. Who can help you do those activities?
13. Get the parts and materials and build the invention. Get any help you need to build it.
14. Test and evaluate the invention.
15. Identify any problems with the invention.
16. Repeat steps 5 to 15 until the invention works as planned.
17. Name the invention.
18. Plan and create the Invention Display Board.
19. Practice what you will say about your invention in the Judging Circle.
20. Be proud of what you have done!!!!

Explaining the Problem and Identifying a Solution (Identifying and Understanding)

1. What problem are you trying to solve? The more specific you are in describing the problem, the better your solution will be. How did you come up with the problem?
2. What is the result you are trying to achieve? The more specific you are in describing the result you want, the better your solution will be.
3. What are some possible solutions? Which one did you choose to pursue? How did you decide which solution to try? The more specific you are in describing the solution you will create, the better your invention will be. How did you come up with the solution?

4. Has this solution been done before? If it exists, how is your approach different and better? What research did you do to see if this invention had been done before? Who did you talk to? Where did you look? What website did you search? You should show 4 pieces of evidence of different types of research – talking with experts, searching the internet, interviewing friends and family as to how useful this would be, etc.

Where I looked to see if my idea is new:

A.

B.

C.

D.

Document any similar inventions you found, describing how yours will be different:

Teacher Signature - REQUIRED FOR ALL PARTICIPANTS

I approve of the solution/invention my student has chosen to pursue and agree that it not only meets the guidelines shown on the Restrictions and Requirements page, but that it is also safe.

Teacher's Name (Printed)

Teacher's Signature _____ Date

I approve of the solution/invention my student has chosen to pursue and agree that it not only meets the guidelines shown on the Restrictions and Requirements page, but that it is also safe.

Creating and Improving the Design (Ideating and Designing)

5. Draw a model (a sketch or drawing) of the invention you are thinking about building. Label all the important parts and features. Explain how the invention will work. If you need more space, use another blank page.

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6. What problems or issues might you encounter with this design? Is this design compatible with the principle of sustainability? Who did you talk to about this design (another student, parent, teacher, etc.)? What were their comments about your design?
7. How can you fix those problems or address those issues?
8. Repeat steps 5 to 7 until you have a design that you think will work. You may have to make multiple copies of a blank page until you have a good design.

Building the Invention or Prototype (Designing, Building, Testing)

9. What parts, materials, and tools will you need to make the invention and how much will they cost?

10. Where will you get those parts and materials?

11. What additional skills or abilities will you need to make the invention?

12. Who can help you build the invention?

Naming the Invention (Communicating)

17. Naming your invention is important.

- What words describe your invention?
- Think in terms of words that will help you name your invention.
- What is the function of your invention?
- Think in terms of marketing it. How will it solve the problem? How will it help others?

- How is your invention different from others that may already be on the market? If it is similar, what did you do to make it better? How is it different?

- Who is your target audience? Who would use your invention?

Some creative attention-getting techniques you can use are:

- ☐ Alliteration (using the same first letters or sounds): "Kit Kat"
 - ☐ Rhyming: "Light Bright"
 - ☐ Alternative spelling: "Sno Bal"
 - ☐ Using numbers in the name: "Super Clean 3000"
 - ☐ Describing the function of the invention: "Hydro-Blast"
- Based on this analysis, what are some good names for your invention?

- Which name do you like best and why?

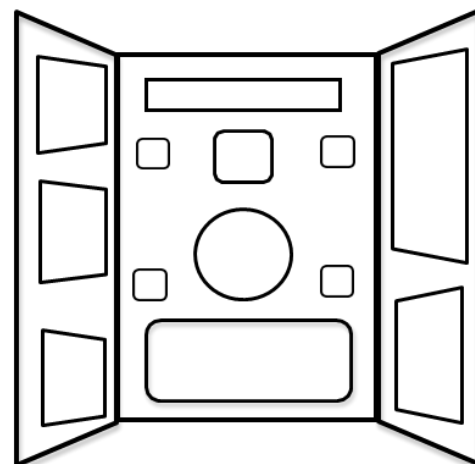
Planning and Creating the Invention Display Board (Communicating)

18. Create your display board. This is an example of what a Display Board might look like, but you can make it look however you want. This is your invention and your display, so use your creativity to tell the story of your invention the way you want.

Be sure you use:

- Fonts that are readable (style, size, color)
- Colors that look good together
- Shapes that are the right size
- Correct grammar and spelling
- Proper punctuation

Maximum size: With the wings folded in, the Display Board can only take 24" of table space. However, you are allowed to open up the wings during your Judging Circle presentation.



Your Display Board **MUST** contain the following information in one consolidated place on the poster:

Student(s) Name(s)

Project Name

Student(s) Grade(s)

Student(s) School

School City, State

Preferred Industry-Focused Award Category (e.g. Telecommunications)

Patent Status (three options: None, Under Counsel, or Patent Pending)

Students should note "Patent Pending" on their posters for Patent Status **only** if a provisional or non-provisional patent application has been officially filed with the USPTO. If you are currently represented by an attorney or patent agent (pro bono or otherwise), then mark "Under Counsel." It is possible to be both "Under Counsel" and "Patent Pending", or just "Under Counsel", or just "Patent Pending" (if you did the filing yourself).

You might also want to add this information:

- Images showing you building or testing
- How the invention was made
- How the invention is used
- The biography of the inventor
- Text which supports and explains any pictures, drawings, charts, etc.
- What scientific principles were used in your invention? (e.g. buoyancy, heat transfer)
- What engineering disciplines were used in your invention? (e.g. electronics, optics)
- Testimonials from users, research results
- Any other information about the invention that will help explain it, what it does, or why it is good

Practicing What You Will Say About Your Invention (Communicating)

19. Be prepared to answer questions. Here are some questions that you might be asked in the Judging Circle by the judges or fellow students. To help you prepare, you might want to write down some of the important parts of your answers so that you have them when you practice giving your presentation.

- How did you come up with the idea for this invention?
- What people, situations, or conditions does this problem affect?
- How did you think up your solution to the problem?

- Where did you get the materials for the invention?
- Who helped you build the invention and what did they help you do?
- Are there other, better materials you could have used that would improve the invention?
- Who has used your invention and what did they think about it?

- What changes might you want to make to your invention?

20. Be proud of what you have done. You will use the problem-solving and communication skills you have gained here throughout your life and career. Congratulations on what you've done!

Blank Page(s)

These blank pages are available for you to add anything to your Invention Log that will help explain what you did, how you did it, and what the results were. This could include drawings, calculations, descriptions, test results, etc. Multiple copies of this page can be inserted anywhere you want in the Invention Log.