



INVENTION CONVENTION STUDENT JOURNAL
INVENTING IS MY SUPERPOWER!

Student Name(s):

School:

School District:

Grade:

Teacher's Name:



HELLO SUPER INVENTORS!

The Invention League knows something about you that you might not know you, as a young *inventor*, have superpowers within you that are just waiting to come out! By the time you complete this journal, you will have engaged superpowers of analysis, brainstorming, confidence, creativeness, critical thinking, curiosity, design, hard work, ingenuity, inquiry, observation, perseverance, researching, resourcefulness and you will have conquered the invention process, unleashing all the superpowers you need to be a super*inventor*!

- ✿ The Journal is a place to record your thoughts, activities, *research* and discoveries as you work to create your own invention.
- ✿ Print legibly and be as clear as you can with your responses.
- ✿ Try using a dark blue or black pen on your final journal copy.
- ✿ If you are working on a team you need only one journal, but both team members should work together and both should sign the journal.
- ✿ You will need to show your journal to any/all judges you meet during the process.

LET'S EXPLORE SOME TERMS

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, on billboards, etc.

brainstorm - to produce an idea, way of solving a problem by holding a spontaneous group discussion.

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 - a person who designs, builds, or maintains engines, machines, or public works.

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.





EXPLORE TERMS (CONTINUED)

hypothesis - a proposed explanation made on the basis of limited evidence; starting point for further investigation.

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

interview - a formal consultation usually to evaluate qualifications; a report of 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.

marketable - able or fit to be sold or marketed.

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.

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.



EXPLORE TERMS (CONTINUED)

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 from; a place, person, or thing from which something originates.*

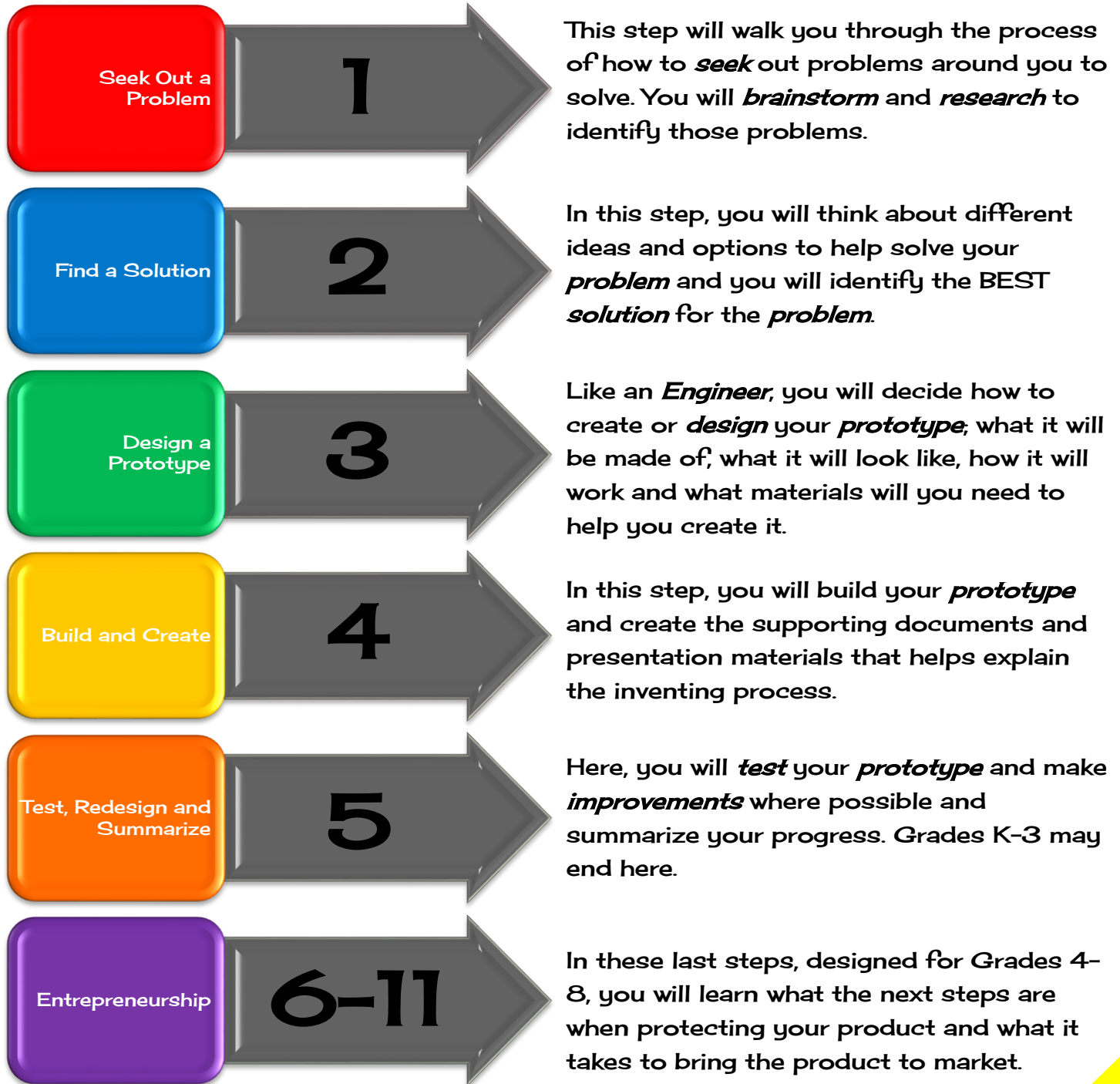
substantially - *to a great or significant extent.*

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.*

SUPERTHINKERS - WHAT IS INVENTING ALL ABOUT?

There are five main steps to completing the invention process and additional steps thinking like an *entrepreneur* (for grades 4-8):



STEP 1: SUPERSEEKERS - SEEK OUT A PROBLEM

KEY TERMS: PROBLEMS, BRAINSTORM, SEEK, RESEARCH, TESTIMONIALS, PUBLICATION, DATA

Problems can be found everywhere. You might discover these *problems* at home, your school, the library, on the farm, listening to the news or somewhere else entirely. If you think of something that drives you crazy or something you have trouble doing think about what might make it easier; that might be a great place to start. It's also important to talk to others about what *problems* they have in their day-to-day life. Talk to your family, friends and members of your community about *problems* that need solved, big and small. **Brainstorm**, think about, talk about and ponder different *problems* to solve.

Keep an open mind to new industries and ideas as you *seek* out the *problem* you want to solve!



You can try selecting one or more of the industries below where you think it will be interesting to find *problems*. Do your *research* to find out what *problems* impact that industry. Jump on the Internet and look through local news stories, talk with professionals in the industry (record those *testimonials* or things they say for proof of your *research*), look through trade *publications* (magazines about a particular topic) and visit libraries to find information or surveys about the subject. These are all great ways to *research* the *problems* you are thinking about solving.

Agriculture	Goods/Fashion	Food	Organization
Animal/Pet Care	Education	Government	Safety
Architecture/Building	Energy	Healthcare	Sports/Toys
Arts	Environmental	Household	Technology
Communication	Financial	Manufacturing	Transportation
Consumer			

Ideas for *brainstorming* to find your *problem*:

- ✿ Write out all the ideas you come up with when you *brainstorm*!
- ✿ Who can you *brainstorm* with? A parent, friend, teammate, class, teachers, siblings, who?



SEEK OUT A PROBLEM (CONTINUED)

Please document up to three of the *problems* you uncovered in your *brainstorming* and the industry each *problem* impacts.

First *Problem*:

(grades 4–8 attach *data* to support the severity and prevalence of this *problem*)

The industry it impacts:

Second *Problem*:

(grades 4–8 attach *data* to support the severity and prevalence of this *problem*)

The industry it impacts:

Third *Problem*:

(grades 4–8 attach *data* to support the severity and prevalence of this *problem*)

The industry it impacts:

The *problem* I chose to solve is:

Why I chose this *problem* and who has this *problem*:



Feel free to add a list of additional *problems* you'd like to solve.

Note: Some *problems* impact more than one industry. Write down which industry your *problem* impacts the most.



SUPERPOWERS ENGAGED
INQUIRY, BRAINSTORMING,
RESEARCHING, PROBLEM SOLVING,
INGENUITY, CREATIVITY, CRITICAL
THINKING

STEP 2: SUPERSLUTHERS - FIND A SOLUTION

KEY TERMS: RESEARCH, SOLUTIONS, PROBLEM, SEEK, INTERVIEW, TESTIMONIALS, PUBLICATIONS, BRAINSTORM, INVENTOR, DATA, HYPOTHESIS

Research to identify as many existing **solutions** to your **problem** as you can. Similar to the **problem-seeking** process; **interview** professionals in the industry (record those **testimonials** - what they say), look at articles on the Internet, **research** trade **publications** and visit the library to find information or surveys - these are great places to start your **research**. You may also want to **interview** your own set of people to find your own surveys to help you find the best **solution** to your **problem** - save these as proof of your **research** methods.

Now that you know what **solutions** (if any) already exist, **brainstorm** to identify new **solutions**.

- There can be many **solutions** to a single **problem**. Your goal as an **inventor** is to find as many **solutions** as possible so that in the end, you can select the best **solution** for your **problem**.
- Keep an open mind as you look for **solutions**. Just because something has not been tried before does not mean that it will not work!
- Who can help you **brainstorm solution** ideas? Anybody!



Now you can document up to three **solutions** you found:

First Solution. (grades 4-8 attach **data** to support the solution you chose)

What materials will you need?



FIND A SOLUTION (CONTINUED)

Will you need special tools?

What help will you need from others?

What will be involved in turning this idea into a *solution*?

What do you think will happen when you try it? This is called your *hypothesis*.

Second Solution: (grades 4-8 attach *data* to support the solution you chose)



FIND A SOLUTION (CONTINUED)

What materials will you need?

Will you need special tools?

What help will you need from others?

What will be involved in turning this idea into a *solution*?

What do you think will happen when you try it? This is called your *hypothesis*.



FIND A SOLUTION (CONTINUED)

Third *Solution*: (grades 4–8 attach *data* to support the solution you chose)

What materials will you need?

Will you need special tools?

What help will you need from others?

What will be involved in turning this idea into a *solution*?



FIND A SOLUTION (CONTINUED)

What do you think will happen when you try it? This is called your *hypothesis*.

Choose the best *solution* you will move forward with and explain why you chose it:

STEP 3: SUPERDESIGNERS - DESIGN A PROTOTYPE

KEY TERMS: SOLUTION, ORIGINAL, SUBSTANTIALLY, RESEARCH, PUBLICATIONS, PATENT, PROTOTYPE, DESIGN, TEST, OPERATIONAL, INVENTORS, DATA, SOURCE, DESIGN, IMPROVEMENTS



Originality:

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

- Libraries
- The Internet
- Stores
- Books
- Professionals in the Industry
- Trade *Publications*
- United States *Patent* and Trademark Office by visiting:
<http://www.uspto.gov/>

Prototype Requirements (keep these in mind as you *design* your *prototype*):

- Your teacher must sign off on your *solution*/invention before you begin building your *prototype*.
- Any *testing* on animals must be signed off on by a licensed veterinarian.
- *Prototype* and display combined must be no larger than 2'x3' and be able to set on a table top.
- Does not have to be a working model, but you need to be able to explain how it would work, but if it can be *operational*, it should be.
- Electricity may NOT be used at any regional or state competitions. Batteries are fine.
- *Inventors* may not use lighters, matches, candles or any other open flame or heat *source* or anything material or liquid considered combustible.
- Inventions may not contain biohazards or utilize any materials that are, or could become dangerous.
- Demonstrations/presentations may not include human beings or living creatures.
- *Data* Collection (requirement for grades 4-8): The information documented during *data* collection tells a story, allowing others to interpret the *data*. Inventors grades 4-8 are expected to employ *data* collection during the invention process. Talk with your teacher about the best way to collect and show this *data* within your journal and/or presentation. Feel free to add additional pages to your journal if necessary.
- 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.



DESIGN A PROTOTYPE – IDEA ORIGINALITY (CONTINUED)

Student Name(s):

The *solution* I chose:

Where I looked to see if my idea is new:

- 1.
- 2.
- 3.

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

Teacher Signature
REQUIRED FOR ALL PARTICIPANTS

Veterinarian complete this section
IF any animal testing will take place.

I approve of the <i>solution</i> /invention my student has chosen to pursue and agree that it not only meets the <i>prototype</i> guidelines shown on the previous page but that it is also safe.	I find the <i>solution</i> /invention this <i>inventor</i> has chosen to pursue will not be harmful in any way to animals.
Teacher's Name (Printed)	Licensed Veterinarian Name (Printed)
Teacher's Signature Date	Licensed Veterinarian Signature Date



DESIGN A PROTOTYPE (CONTINUED)

Before you build: sketch what you think your invention should look like.

Here are some tips in creating your *design*:

- ✿ Draw different *designs* of your invention; how might you make mechanisms that will make your invention move/run, etc.
- ✿ Sketch or computerize your *designs* on other pieces of paper to later add to your design board if you choose to make one.
- ✿ Have someone take pictures of you throughout the *design* process to add to your design board later as well.

Please document or sketch your *design* below:



STEP 4: SUPERBUILDERS - BUILD YOUR PROTOTYPE

☀️ **KEY TERMS:** PROTOTYPE, SOLUTION, TEST, OPERATIONAL, INVENTOR, SOURCE, IMPROVEMENTS

Superbuilders: it's time to get your hands dirty!!

☀️ Be sure to follow the *prototype* requirements:

- ✓ Your teacher must sign off on your *solution*/invention before you begin building your *prototype*.
- ✓ Any *testing* on animals must be signed off on by a licensed veterinarian.
- ✓ *Prototype* and display combined must be no larger than 2'x3' and be able to set on a table top.
- ✓ Does not have to be a working model, but you need to be able to explain how it would work, but if it can be *operational*, it should be.
- ✓ Electricity may NOT be used at any regional or state competitions. Batteries are fine.
- ✓ *Inventors* may not use lighters, matches, candles or any other open flame or heat *source* or anything material or liquid considered combustible.
- ✓ Inventions may not contain biohazards or utilize any materials that are, or could become dangerous.
- ✓ Demonstrations/presentations may not include human beings or living creatures.
- ✓ 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.

☀️ You can create your *prototype* out of items you have around your house, school or that you can borrow. It is not necessary to spend money to make your *prototype* - remember a *prototype* is just the first model of your invention. This is a model used to demonstrate your invention.

☀️ Please note: Always have an adult help you as needed when using power tools or other equipment that could be dangerous.



PERSEVERE POWER!

Most often your *prototype* will not be perfect at first, and that's okay, because imperfections give you the opportunity to make *improvements*.

Keep trying and keep a record of how *testing* goes, the challenges you face and the changes you make to the *prototype*.

Take pictures of the process to document how and what you do along the way!

STEP 5: SUPERINVENTORS – TEST, REDESIGN AND SUMMARIZE

KEY TERMS: INVENTOR, PERSEVERANCE, OPERATIONAL, HYPOTHESIS, SOLUTION, IMPROVEMENTS, DURABLE, TEST, RESEARCH, TESTIMONIALS, DESIGN, PROBLEM

Being an *inventor* is hard work, often your first design is unsuccessful. By engaging your powers of *perseverance* you will succeed in solving your problem. Fun fact: Superhero Thomas Edison invented the commercially practical incandescent light in 1879. It took him more than 1000 attempts before he had an *operational* model.



My *hypothesis*, what I thought would happen from page 6 or 7:

How well did it work? If it did not work right, don't give up - try to *experiment* with your *solution* another way.

List possible *improvements*. Ask yourself: Can you make it out of more *durable* materials? Can you make it bigger, smaller? Does it need to be waterproof? What changes will make it work better?

1.

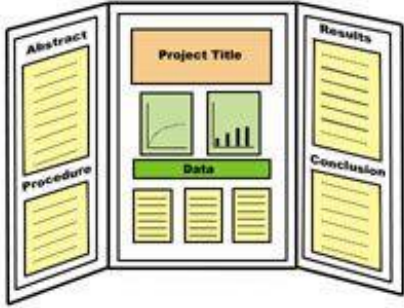
2.

3.



TEST, REDESIGN AND SUMMARIZE (CONTINUED)

Use this form to record new *test* results on any *improvements* you made.



You will want to display information with your *prototype* to share your invention story with the judges and others.

- ✿ Tri-fold boards or poster boards make nice display options.
- ✿ Things to display: your *research*, surveys and/or *testimonials*, sketches, diagrams, materials that did or did not work in the development process and any photos you took along the way.
- ✿ Any additional documentation that applies to your *research*, *design*, creation and *testing* processes.

What I thought would happen with my *improvements*:

How well did the *improvements* work?

List possible future *improvements*:

1.

2.

3.



TEST, REDESIGN AND SUMMARIZE - SUMMARY
(THIS SECTION IS IMPORTANT IN PROTECTING YOUR INVENTION)

Name of my invention:

Problem my invention solved:

How my invention works:

The date I/we first thought of the idea:

Inventor Name (printed):

Inventor Signature:

Date:

Inventor Name (if two *inventors* teamed up):

Inventor Signature:

Date:

Witness name (printed):

Witness signature:

Date:

Function/Proof¹ - How my invention solves the *problem*:



TEST, REDESIGN AND SUMMARIZE - SUMMARY (CONTINUED)

Basic diagram of my invention with parts labelled:



TEST, REDESIGN AND SUMMARIZE - SUMMARY (CONTINUED)

Materials I used to make my *prototype*.

Observation - Where I discovered the *problem*?

Research - Who has this *problem*.

My Team - Who helped me come up with the ideas? (who were my assistants)

About Me - What I liked most about being an *inventor*?

Grade K - 3 end here.

STEP 6: SUPERENTREPRENEURS - WHAT COMES NEXT?

KEY TERMS: INVENTORS, ENGINEERS, ENTREPRENEUR, PRODUCT, PROFITABLE, INVEST, PATENT, RESEARCH

This section is designed for Grades 4 - 8. Over the years, we've discovered that great *inventors* need to know what comes next. You are now designers, *engineers*, scientists, *inventors* and innovators in your own right. You worked hard; so congratulations!

But you may also be or want to be an *entrepreneur*!

The *entrepreneur* develops a business plan, gets the people and other resources needed to create their new business and is fully responsible for its success or failure.

Some of you may want to take your *product* to market. You may have a very *profitable product* that an *investor* would want to *invest* in or a *product* you'd like to create a sales plan around. There are some ways to protect your work as described below. In addition, there are ways for you to work toward those goals as well and for that we turn to step 7.



Protect Your Product

If you are interested in protecting your invention, you can apply for a *patent* through the United States *Patent* and Trademark Offices (USPTO). It does take time and money to *patent* your invention so keep that in mind when you start the process. Go to www.commerce.gov for more information about this process.

Use a Patent Attorney's Help:

A *patent* attorney can certainly help you with this process if you find it difficult to navigate this process on your own. Feel free to contact info@inventionleague.org and we can introduce you to a *patent* attorney in your area.

Use a Patent or "Idea" Company:

There are many companies around the market who can help you *patent*, license and sell your *product*. Many will have forms/contracts to sign so that all their work does not go unpaid. This is an option that is very appealing and helpful for those people who have a hard time getting their *products* noticed. However, any of these entities need to be *researched* carefully and thoroughly. If you contact us at info@inventionleague.org we can certainly introduce you to friends who can help!

STEP 7: PRODUCT - THE SUPER IDEA

 **KEY TERMS: PRODUCT, RESEARCH, PROBLEM, MARKETABLE**

Now that you've generated your idea into an invention, you have a *product* to sell. You've already done your *research* to see what similar *products* are out there, now it's time to compare them. Try to find two *products* that solve *problems* similar to yours and answer the following questions.



Product 1: This *product* is similar to mine because:

This *product* is different than mine because:

It is important to understand why your *product* is useful to other people so you understand it's worth and value. Explain what makes your *product* more *marketable* than this *product*?

Product 2: This *product* is similar to mine because:



PRODUCT - THE SUPER IDEA (CONTINUED)

This *product* is different than mine because:

It is important to understand why your *product* is useful to other people so you understand it's worth and value. Explain what makes your *product* more *marketable* than this *product*?



STEP 8: PROFITABILITY - SUPER EVALUATION

★ KEY TERMS: MARKETABLE, PRODUCT

Now that you know what's unique and *marketable* about your *product* you need to evaluate your opportunities. Who are your customers? It's a big market out there so let's see how we can help!

Now you can document up to three of the customers (users) you might have:

User one is: _____

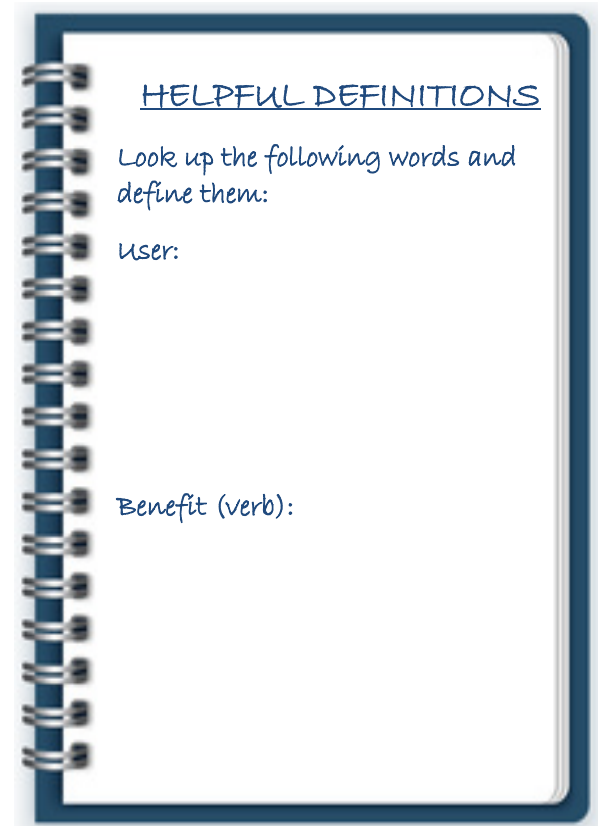
How does it help them or benefit them to use it?

User two is: _____

How does it help them or benefit them to use it?

User three is: _____

How does it help them or benefit them to use it?



*Feel free to add another sheet if you have more users who would benefit from your invention.



STEP 9: PLAN - SUPER ORGANIZATION

*** KEY TERMS: PRODUCT, ENTREPRENEUR**

This is the place where you can conceptualize who you are as more than just a *product*, to be a true *entrepreneur* you need a plan and a vision to go with it. If you were to start a company around this *product* think about what you hope to do for your customers and how you want the working environment to be for your employees as well!

What is your company's mission? In other words, why does your company exist, what is its reason for being out there? Write a simple sentence explaining your mission:

What are your company's goals? What does your company expect to accomplish in a set amount of time? List your goals:

What are your company's primary objectives or steps/tasks you can do to help reach your goals? List them below:

STEP 10: PATHWAY - SUPER MANUFACTURING TO MARKETABILITY

KEY TERMS: PRODUCT, INVEST, PROFIT, SOURCE



Having a vision is a great step to have completed but in reality if you're going to spend time creating and trying to run a business, you have to make money! You might even have other people like your *product* so much they'd like to *invest* in it.

In order to know how much you will charge for your *product* and eventually, how much *profit* you will probably make from a *product*, you need to figure out what it costs for you to make that *product* first.

Use the following chart to help you determine what making one *product* will cost you.

Name of Material Used: Example AA Batteries	Cost of that Material/Item: Example \$1.22
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.
	Total Cost: Add up your numbers to learn the total cost of making just one <i>product</i> /one invention (also called cost per unit).



PATHWAY - SUPER MANUFACTURING TO MARKETABILITY (CONTINUED)

Please spend some time looking up other similar inventions/*products* and their costs (also known as cost analysis). Please *source* where you found this information.

First invention or *product* is:

The cost for this *product* is: \$

Second invention or *product* is:

The cost for this *product* is: \$

Third invention or *product* is:

The cost for this *product* is: \$

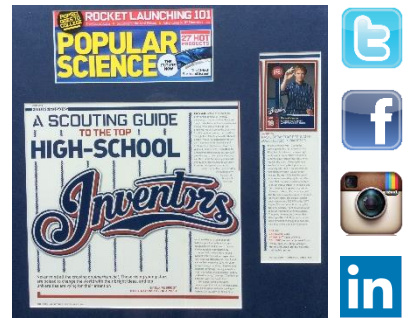
After careful thought and analyzing what other *products* cost; the amount of money I think people will pay for my invention is: \$

STEP 11: PITCH - SUPER SALES

★ **KEY TERMS:** ADVERTISE, MARKETING, PITCH, PRODUCT, PROBLEM, PROTOTYPE, TEST, DESIGN, ENTREPRENEUR

There are many different ways to *advertise* and *market* and *pitch* your *product*. Here are some great ways to let people know about your *products*.

- ★ TV Commercial
- ★ Radio Commercial
- ★ Public Relations Announcement
- ★ Celebrity Endorsement
- ★ Magazine Ad
- ★ Newspaper Ad
- ★ Website Page
- ★ Website Ad
- ★ Social Media Channel
- ★ Billboard
- ★ Fliers
- ★ T-shirts
- ★ Bumper Stickers
- ★ Business Cards
- ★ Word of Mouth



Now it's time to write your *pitch*. Here's a tip: If you had just a quick elevator ride with that decision maker - what would you say? People often call this your "elevator *pitch*" for that reason.

List 2-to-4 of the most important things you would like someone to know about your *product*.

- 1.
- 2.
- 3.
- 4.



PITCH - SUPER SALES (CONTINUED)

Below make a sentence or two containing those important items.

- Helpful tip: some people like starting their *pitch* by asking the other person a question like...“have you ever heard of?” Or “do you have a *problem* with xyz? I did too, that’s why I invented...”

PRACTICE MAKES PERFECT

Now that you have completed your *pitch* - try it out on others!

Share your *pitch* with others, especially people who know nothing about your *product* and see what they have to say about it. **What did they say? Write it here:**



This will help you rework your *pitch* and perfect it. Do you remember the *prototype* stage, you *tested*, *redesigned* and then *tested* again. The *pitch* phase is very similar, sometimes people like to call this phase - practice makes perfect!



You did it! With your superpowers you created a plan and you are on your way to being an extraordinary *entrepreneur*! We wish you all the best - keep on dreaming, keep on inventing!

**CONGRATULATIONS INVENTOR, YOU HAVE SUCCESSFULLY
ACTIVATED YOUR SUPERPOWERS. YOU HAVE MADE YOUR WORLD
A BETTER PLACE...ONE INVENTION AT A TIME!**





Dear Inventors,

I want to thank you for taking the time to document your invention and *entrepreneurship* process. It is not an easy thing to do and it is a skill that takes time, practice and determination.

Thank you for sharing your creative, imaginative and well **tested** ideas with us! It's important that you remember the process that you went through to invent because it will be the same process that you continue to use every day when you identify a *problem* and think critically to identify the possible and best *solution*. Again, it is a skill that if you learn and practice regularly will be one that you'll use wherever your future takes you.

There is a quote that I heard years ago when I started working in the invention-education space and it stuck with me so I'd like to share it with you.

I believe it is possible to learn how to think, you've proven that through your completion of not only this journal but the Invention League program and you'll continue to do it each and every day.

It must be remembered that the purpose of education is not to fill the minds of students with facts... it is to teach them to think, if that is possible, and always to think for themselves.

--- Robert Hutchins,
American Education Philosopher

I look forward to seeing your inventions and hearing about your successes. Be sure to protect your mind and your ideas, we believe in you. Your uniqueness and creativity are two of your most powerful assets.

Keep us up to date on where your inventing takes you, and we wish you the best of luck in all you do!

Sincerely,

Veronica Lynagh
Executive Director
Invention League

The Invention League is an education nonprofit organization, completely funded by generous personal and corporate donors. Thank you to our sponsors who have made the continued growth of this program possible for Ohio's young inventors.