

invention

CONVENTION.org

every possibility exists in a child's mind.

STUDENT JOURNAL

WITH THIS BOOK I CAN INVENT THE FUTURE!

Student Name: _____

School: _____

School District: _____

Grade: _____

Teacher's Name: _____

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WELCOME INVENTORS!

Inventor tips for filling out your journal:

- ✓ Record your thoughts, activities, research and discoveries on these pages as you work to create your own invention.
- ✓ Print legibly and be as clear as you can with your responses.
- ✓ It's best to use 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.
- ✓ If you are chosen to participate in the Invention Convention Competition (local or regional), you will need to show this book or a similar journal or inventor's log to the judges.



LET'S EXPLORE SOME TERMS

research - *the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions.*

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

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

solution - *something that is used or done to deal with and end a problem : something that solves a problem.*

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

experiment - *a scientific procedure undertaken to make a discovery, test a hypothesis, or demonstrate a known fact.*

hypothesis - *a supposition or proposed explanation made on the basis of limited evidence as a starting point for further investigation.*

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

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.*

prototype - *an original or first model of something from which other forms are copied or developed.*

data collection - *is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes.*



INTRODUCTION TO INVENTING

There are just five main steps to completing the invention process:

1 Find a Problem

You will brainstorm and research to identify problems. You might discover these problems at home, your school, the library, on the farm, listening to the news or somewhere else entirely.

2 Identify a Solution

You will think about (brainstorm) and research different ideas and options and the possible consequences.

3 Test

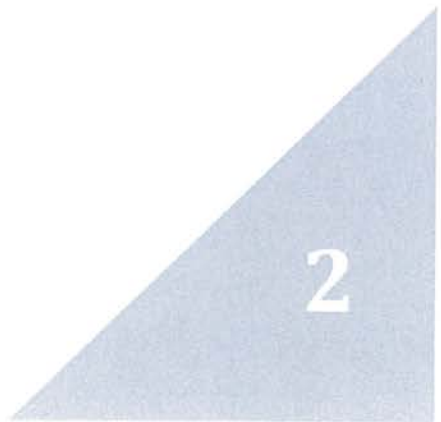
You will test your ideas to determine which makes the best solution to your problem.

4 Design

You will decide what your solution (as it is developed into a prototype) will be made of, what it will look like and how it will work.

5 Create

You will build your prototype and the supporting documents and presentation materials.



1. FIND A PROBLEM

A great way to get started finding a problem is to use a technique called *brainstorming*.

Problems can be found everywhere. Using the "brainstorming" technique, select one or more industries below where you think it will be interesting to find problems. Then - do your research to find out what problems impact that industry? Local news, professionals in the industry, trade publications (magazine about a particular topic), and libraries are all great ways to start your research.

Come up with as many ideas as you can.

What problems can you find in these industries?

- | | | |
|-----------------------|---------------|----------------|
| Agriculture | Energy | Manufacturing |
| Animal | Environmental | Organization |
| Architecture/Building | Financial | Safety |
| Arts | Food | Sports |
| Communication | Healthcare | Transportation |
| Education | Household | |

"I can't begin to tell you the things I discovered while I was looking for something else."

— Shelby Foote

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

Here are examples of how you can brainstorm to find your problem:

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

Most people spend more time and energy going around problems than in trying to solve them.

Henry Ford (1863 - 1947)
American Industrialist and Founder of the Ford Motor Company

BRAINSTORMING TO FIND PROBLEMS:

Agriculture

- ✓ dangerous pesticides run off farm fields
- ✓ fuel needs to be made from renewable crops, like soybeans

Environmental

- ✓ more than 60 million plastic water bottles are thrown away every year and they don't biodegrade (biodegrade — to decay and become part of the environment)

Communication

- ✓ it is hard for older people (like my grandparents) to work with some of the new technology, like tv and dvd controllers, cell phones, etc.



FIND A PROBLEM (CONTINUED)

Document three of the problems you uncovered in your brainstorming and the industry each problem impacts:

The problems of the world cannot possibly be solved by skeptics or cynics whose horizons are limited by obvious realities. We need men and women who can dream of things that never were.

John F. Kennedy
35th U.S. President

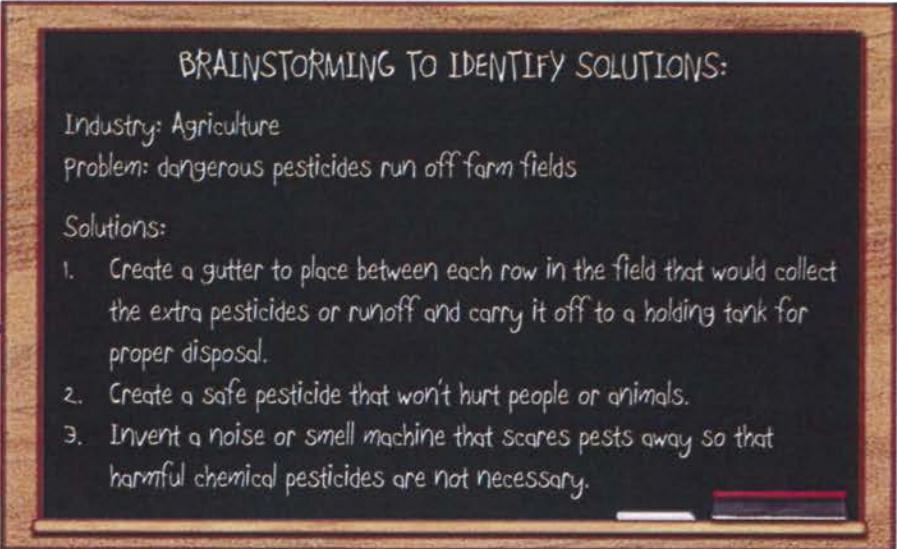
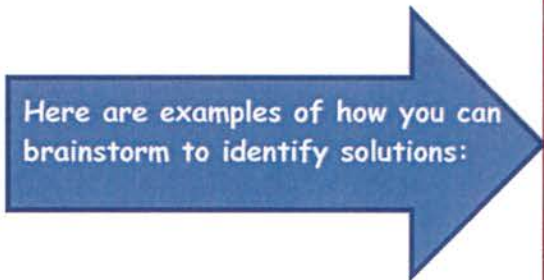
- ✓ Some problems impact more than one industry. Write down which industry your problem impact the most?
- ✓ There can be many solutions to a single problem.
- ✓ Document as many ideas as you can come up with that solve your problem.
- ✓ Your goal as an inventor is to find as many solutions as possible so that in the end you can select the best solution for your problem.
- ✓ Keep an open mind as you look for out solutions. Just because something has not been tried before does not mean that it will not work!
- ✓ Who can help you brainstorm solution ideas?
- ✓ How many solutions did you come up with? Who helped you? Choose the problem you want to solve.
- ✓ Explain why you chose this problem and who your solution will help.

1.	
	The industry it impacts:
2.	
	The industry it impacts:
3.	
	The industry it impacts:
	The problem I chose to solve:
	Why I chose this problem and who it will help:

2. IDENTIFY A SOLUTION

Research to identify as many existing solutions to your problem as you can. Professionals in the industry, trade publications (magazine about a particular topic), the internet and libraries are all great ways to start your research.

Now that you know what solutions (if any) already exist, come up with at least three new possible solutions to the problem.



Document three of the solutions you found:

Solution #1:	
Solution #2:	
Solution #3:	

3. TEST



Pick one of your ideas and think about how it will become a solution. Write down the steps you'll need to take and what you think will happen. This is called your hypothesis.

Maybe it will work and maybe it won't. If not, don't give up - try to experiment with your solution another way.

Failure is nature's plan to prepare you for great possibilities.

Napoleon Hill

1 st Idea tested:
Steps to take:
What I think will happen (my hypothesis):
How well did it work?
List 3 possible improvements:
1.
2.
3.

TEST (CONTINUED)



Pick another of your ideas and think about how it will become a solution. Write down the steps you'll need to take and what you think will happen. This is called your hypothesis.

Did it work? Did it work better than the 1st idea you tried? If not, keep trying!

I have not failed. I've just found 10,000 ways that won't work.
Thomas Edison

2nd Idea tested:

Steps to take:

What I think will happen (my hypothesis):

List 3 possible improvements:

1.

2.

3.

How is this solution different/better/worse than the 1st one?

TEST (CONTINUED)

So many great ideas!



Pick another of your ideas and think about how it will become a solution.

Write down the steps you'll need to take and what you think will happen. This is called your hypothesis.

Did it work? Did it work better than the 2nd idea you tried? If not, keep trying!

Testing leads to failure, and failure leads to understanding.
Burt Rutan

3rd Idea tested:

Steps to take:

What I think will happen (my hypothesis):

List 3 possible improvements:

1.

2.

3.

How is this solution different/better/worse than the 2nd one?



4. DESIGN YOUR PROTOTYPE

(SIGNATURE(S) REQUIRED FOR THIS SECTION)

So that you can demonstrate your invention you are required to design and build a prototype. You will also want to display information about your invention to share with the judges and others.

Prototype Requirements:

- ✓ Your teacher must have 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.
- ✓ Electricity may NOT be used at regional finals. 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 (additional requirement for grades 4-8): The information documented during data collection tells a story, and allows others to interpret the data. Inventors grades 4th - 8th 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.

Design is a funny word. Some people think design is how it looks. But of course, if you dig deeper, it's really how it works.

Steve Jobs

Originality:

It is very important that your solution is *original* and does not already exist.

Great places to research to find out if your idea already exists:

- Libraries
- The Internet
- Stores
- Books
- Professionals in the Industry
- Trade Publications (magazine about a particular topic)
- United States Patent and Trademark Office by visiting: <http://www.uspto.gov/>

On the next page document your research to ensure your idea is original.



DESIGN YOUR PROTOTYPE (CONTINUED)

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

6. CREATE YOUR PROTOTYPE

It's time to create your prototype!

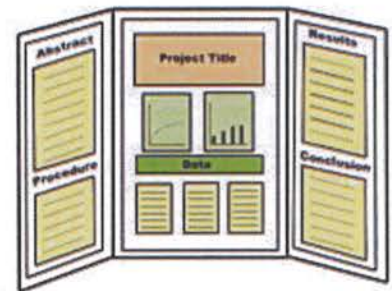
- ✓ Be sure to follow the Prototype Requirements on page 9.
- ✓ Don't forget what we said about originality, your invention should be a new idea.

Most often your prototype will not be perfect at first, and that's okay, because imperfections give you the opportunity to make improvements. Keep a record of how testing goes, the challenges you face and the changes you make to the prototype.

Think about what you will display with your prototype to tell your invention story. Will you use a tri-fold or poster board? Will you display your research, surveys, images of you building and testing your invention? What more could you include?

To invent, you need a good imagination and a pile of junk.

Thomas A. Edison



My Notes:

Future improvements I may make to this invention:



INVENTION SUMMARY

Name of my invention:

Problem my invention solved:

How my invention works:

When I first thought of my idea:

Date: _____

My Name (printed): _____

My Signature: _____ Date: _____

Witness name (printed): _____
(someone not related to you)

Witness signature: _____ date: _____





INVENTION SUMMARY (CONTINUED)

Function/Proof - How my invention solves the problem:

Basic diagram of my invention with parts labelled:



INVENTION 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?