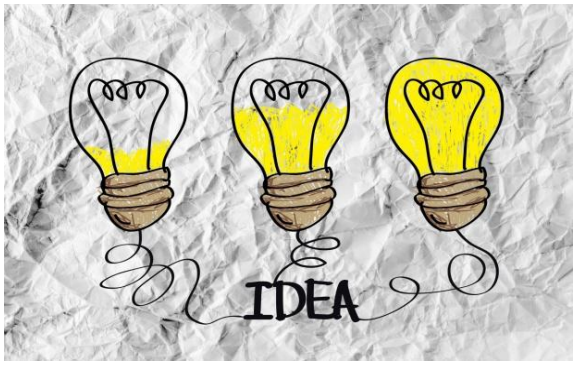
WESTERN NEW YORK iNVENTIoN CoNVENTIoN

the Henry Ford



INVENTOR'S GUIDE:

My Invention Story

Student Inventor: _____

School/Organization: _____

Grade: _____ Room #: _____

Teacher/Parent/Guardian: _____

Start Date: _____, 2023

Due Date : _____, 2024

Dear Student Inventor,

The *Inventor's Guide* will tell the story through your invention process! You may use parts or all of it.

In school or at home, record your ideas, activities, and research, as you create your invention. Fill-in details and specifics, as this will be the proof that <u>you</u> came up with ideas for your <u>original</u> invention.

You MAY…

- **work alone or with a team (4 partners-max).**
- **each member in a team will keep their own *Inventor's Guide*. Add your initials to each other's pages when working cooperatively. Add more paper when more space is needed.**
- **have support from family, classmates, friends, and your research.**
- **use the glossary and add to it as often as you need.**
- **make mistakes, fail, redo work, and change & revisit ideas.**
- **Have FUN!**

You MUST…

- **write, draw and make meaningful notes that are true (no fantasy)!**
- **apply the *7-Step Invention Process*.**
- **put effort and perseverance into the invention process to be successful.**
- **keep your work in a safe place.**
- **initial each page at the bottom of the *Inventor's Guide* or tablet as completed.**
- **include your final prototype (model) and trifold (display board) for entry into the WNYiC by the due date. Save your work from the *Guide*.**

Let the invention journey begin!

Sincerely,
The WNYiC Team and Education Committee

L-I and L-II STATEMENT OF ORIGINALITY AND AUTHENTICITY

I promise that the ideas in the *Inventor's Guide* are my own or that of my team's, apart from research (including AI) and others' support. The work represents a commitment to myself, my values and society as a thoughtful inventor. (Partners in a team of 2-4 members may complete this together. Each safely keeps his/her/their own *Inventor's Guide*.)

Inventor Name(s):

This is my *Inventor's Guide*. _____

Team Members _____

_____

_____

Inventor Signature(s):

This is my *Inventor's Guide*. _____

Team Members _____

_____

_____

Date: _____

Grade Level(s): _____

School/Program:_____

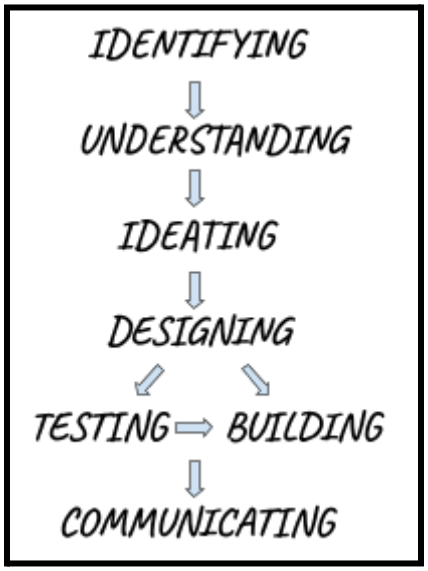
City/Town of NY:_____

Parent/Guardian and Teacher Signatures:

_____

Date: _____

L-I and L-II 7- Step Invention Process



1. IDENTIFYING ~ **Choose a Problem**

2. UNDERSTANDING ~ **Know Cause & Effect of Problem**

3. IDEATING ~ **Brainstorm Best Idea to Solve Problem**

4. DESIGNING ~ **Decide Invention Solution for Problem**

5. BUILDING ~ **Plan and Create Prototype Invention Solution (Model)**

6. TESTING ~ **Test and Redesign Invention Solution**

7. COMMUNICATION ~ **Share Problem, Solution & Invention Process**

L-I STEP 1: IDENTIFYING ~ Choose a Problem

1. For each box, brainstorm **problems** or *pet peeves*: things that bug you or others and may be solved. (See **Page 7** for help.) Write or draw an idea in each box.

broken crayons 			
		 riding a 2-wheel bike	

2. List 3 problems from above that bug you a lot. Tell more.

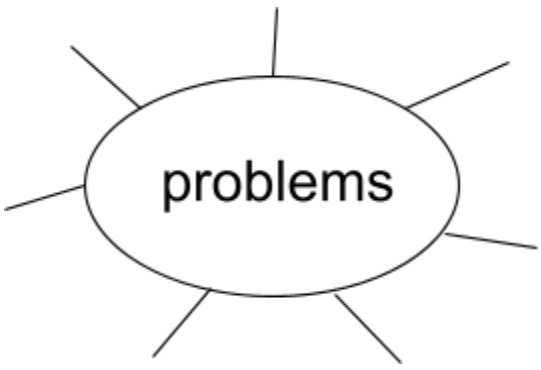
Who or what has a problem?	What is the problem? Why?	How do they feel? 😊 😐 😒
Marietta	a lot of broken crayons, too small	

L-II STEP 1: IDENTIFYING ~ Choose a Problem

1. First, brainstorm **problems** or *pet peeves*: things that bug you or others. Write and/or draw one (1) idea in each square. (See **Page 7** for help.)

broken crayons 			
		can't charge my iPad without an electrical outlet	

2. Next, ask a classmate, friend or family member about things that they wish would work better, easier or differently. You may also think of a **problem** with an animal or in the environment. Be mindful. Ask good questions. Fill-in the web.



L-I and L-II STEP 1: IDENTIFYING ~ Choose a Problem (CONTINUED)

3. Then, star ☆ one (1) **problem** or *pet peeve* in the chart OR web that you really wish you could change or improve.

4. Last, write and/or draw the one (1) **problem** ☆ below that you may turn into an invention. Include details, labels, and feelings. (This will help you understand the problem and eventually the solution.)

L-I ⚙️ *STEP 2: UNDERSTANDING* ~ **Know Cause & Effect of Problem**

👇Finish this statement with the **cause** and **effect** of your **problem**☆ from *STEP 1*:

If (**cause**)_____

_____

_____,

then (**effect**)_____

_____

_____.

✍️ Make a <u>sketch</u> of what it looks like to solve your **problem**☆**.**

L-II ⚙️ *STEP 2: UNDERSTANDING* ~ **Know Cause & Effect of Problem**

👇Fill-in the statement to show that you understand the **cause** and **effect** of the **problem** ☆ or *pet peeve* you chose in *STEP 1*.

If or when or be**cause** _____
_____
_____
_____,
then the **result** or **effect** is _____
_____
_____
_____.

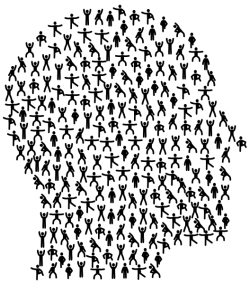
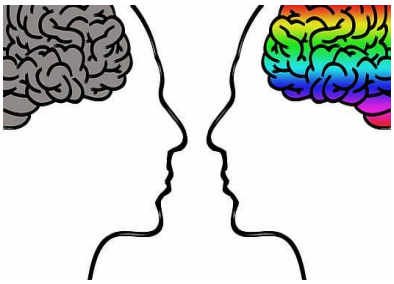
👉Describe three (3) ways you could improve or change the **effect** of the **problem**. This helps with potential solutions:

- Wouldn't it be nice if _____
  _____
  _____
  _____
- If only _____
  _____
  _____
  _____
  _____ it would be better (or easier or faster or different).
- To solve my **problem**, I wish _____
  _____
  _____
  _____
  _____.

✍️On the back, make a quick <u>sketch</u> of how you see or imagine the solution to your **problem**☆**.**

Practice these rules in order to think of many, new and different **ideas**:

BRAINSTORMING

ALONE / TEAM	RULE	MEANING
	think of lots of ideas	quantity not quality
	stretch your brain	new and different ideas
	piggyback	add to others' ideas
	no judging	welcome all ideas related to topic

L-I STEP 3: IDEATING ~ Brainstorm Best Idea to Solve Problem

1. You understand your **problem** ☆ better.

Rewrite your **problem:** _____

_____

_____

_____

2. Use **BRAINSTORMING RULES**. List 3 **ideas** that may solve your **problem**. You may get help. (For more **solutions** use the back!)

a. _____

_____

b. _____

_____

c. _____

_____

3. Choose a real **solution** (not pretend nor fantasy) above.
Draw a happy face ☺ by the best **idea** to solve your **problem**.
Original? Helpful to others or animals?

L-II STEP 3: IDEATING ~ Brainstorm Best Idea to Solve Problem

➔ Now that you better understand your **problem** ☆, go back to **Page 5 and Page 6a.** Reread and refine.
Rewrite your **problem:** _____

_____

_____

_____

➔ Apply the **BRAINSTORMING RULES** in order to list four (4) **ideas** that may solve your **problem**. You may get support from family, your team and research. Feel free to add more **solutions** on the back!

a. _____

_____

b. _____

_____

c._____

_____

d. _____

_____

➔ Decide: Put a happy face ☺ by the best **idea** to solve your **problem**.
➔ Why do you feel good about this **solution**? Realistic (not fantasy)? Original? Useful to others or animals? Can you make a model of it?

L-II STEP 3: IDEATING ~ Brainstorm Best Idea to Solve Problem

(CONTINUED)

☐ Discuss your **problem** and **solution** with others!
Offer details to support your opinion. Listen to others' feedback.

☐ Use this space (and the back) to record new **ideas** that developed from your interview with others about your **problem** and **solution**.
Include any "a-ha" moments. Write, draw, map, web, diagram…

L-I STEP 3: IDEATING ~ Brainstorm Best Idea to Solve Problem (CONTINUED)

1. Is your **idea** to **solve** your **problem** original (like no other)? With an adult, research to find out if your **solution** is original.

   - ☐ Libraries (neighborhood, Internet Archive)
   - ☐ Internet (www.google.com, www.bing.com)
   - ☐ Stores (www.amazon.com, www.walmart.com, www.bestbuy.com, www.target.com, www.etsy.com)
   - ☐ Professionals to interview (www.linkedin.com)
   - ☐ US Patent and Trademark Office (www.uspto.gov)

2. IF your **solution** has been invented, repeat **Page 8**, #2. and #3. Change your **idea** to make it original.

3. Now that you've chosen your best **solution** for your **problem**, what are pros (good points) and cons (bad points)? Fill-in chart.

Solution	Pros 👍 +	Cons 👎 —

L-II STEP 3: IDEATING ~ Brainstorm Best Idea to Solve Problem (CONTINUED)

1. Is your **solution** original (does not already exist OR much different than any other invention)? Research to find out if your **solution** already exists or not. Take time to explore and add your findings on **Page 9**!
   - ☐ Libraries (in-person, online)
   - ☐ Internet (www.google.com, www.bing.com)
   - ☐ Stores (www.amazon.com, www.walmart.com, www.bestbuy.com, www.target.com, www.etsy.com)
   - ☐ Professionals to interview (www.linkedin.com)
   - ☐ US Patent and Trademark Office (www.uspto.gov)

2. If your **solution** has been invented, repeat **Page 8a.** for new **ideas**. Change or improve your **idea** to make it original. Add more paper as needed.

3. Now that you've chosen your best **solution** to your **problem**, what are its pros (good points) and cons (bad points)? Fill-in the chart.

Solution	Pros 👍	Cons 👎

L-I STEP 4: DESIGNING ~ Decide Invention Solution for Problem

- ➢ You understand your **solution** ☺ better.

Rewrite your **solution:** _____

_____

_____

_____

- ➢ Draw and **design** your **solution** to your **problem** below.
  - ○ Label parts, new or recycled materials, and key ideas.
  - ○ Name it.
  - ○ This is the **prototype** (model) for your **invention**.

L-II STEP 4: DESIGNING ~ Decide Invention Solution for Problem

➢ Rewrite your **solution** : _____

_____

_____

_____

➢ Draw your **solution** to your **problem** below, as you imagine it.
➢ Label materials (new or reused), parts, key ideas… Name it.
➢ How will the **invention solve** your **problem**?
➢ This **design** is the **prototype** (model) for your **invention**.

L-I Step 5: BUILDING ~ **Plan & Create Prototype Invention Solution (Model)**

L-I Step 6: TESTING ~ **Test and Redesign Invention Solution**

STEP 1: PLAN steps to BUILD your **prototype** (model) based on your drawing from **Page 11**.

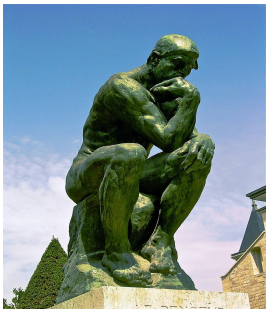
- Get help from others!
- Explore materials and how they work together to build your **invention**.
- Keep a record on the back.

STEP 2: TEST your **prototype**.

- Does it solve your **problem**?
- What changes do you need? Why?
- Draw any new **design** and explain on back or add paper.

STEP 3: ASK questions.

- What don't you understand?
- How do you feel about your **invention**?



L-II Step 5: BUILDING ~ Plan & Create Prototype Invention Solution (Model)

PLAN by listing key ideas about your **prototype** (model) in the tables, as you build and create your **design** for your **invention**. Get help. Change plans as needed.

MATERIALS:

Parts/Types ➡️					
Purpose ➡️					
Quantity ➡️					
Cost $ ➡️					
Recycled ➡️					

STEPS TO BUILD:

First ➘	
Next ➘	
Then ➘	
Later ➘	
Last ➘	

SKILLS &/or ABILITIES:

Me ⇨				
Teammate(s) ⇨				
Parent(s) ⇨				
Teacher(s) ⇨				
Expert(s) ⇨				

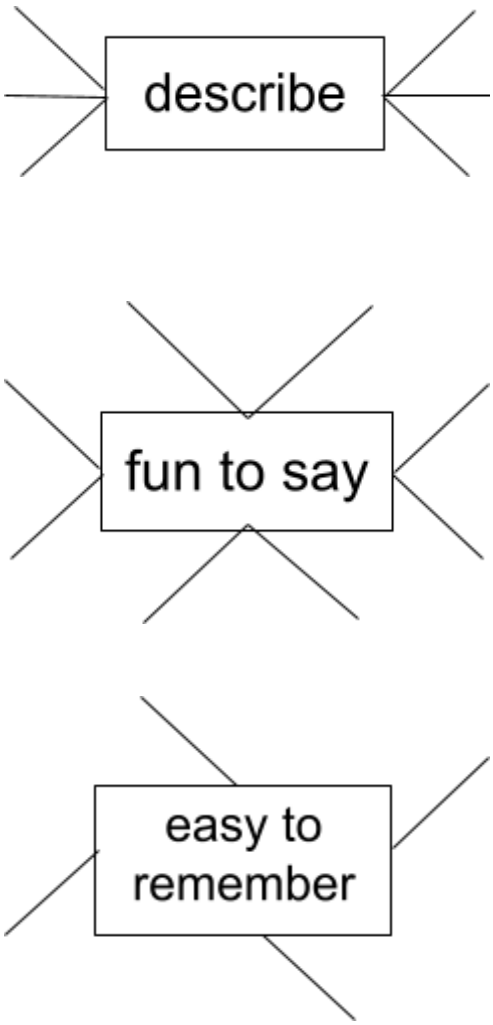
L-II Step 6: TESTING ~ Test and Redesign Invention Solution

TESTING your **solution** is knowing if your **prototype** (model) solves your **problem**. Evaluate your **invention** below using DeBono's Thinking Hats:

Make changes as you repeat the testing process until the **design** of your **prototype** works well. Your **invention** should work the way you want. Feel good about it (**RED HAT**)! Wear the hats and list responses below.

YELLOW HAT - What is good about the **solution**? Any "a-ha" moments?	**GREEN HAT** - What else might this **invention** do?
BLACK + WHITE HATS - What are some concerns, risks or questions about the **prototype** based on the facts?	**BLUE HAT** - What **design** changes did you discover throughout testing? Observations?

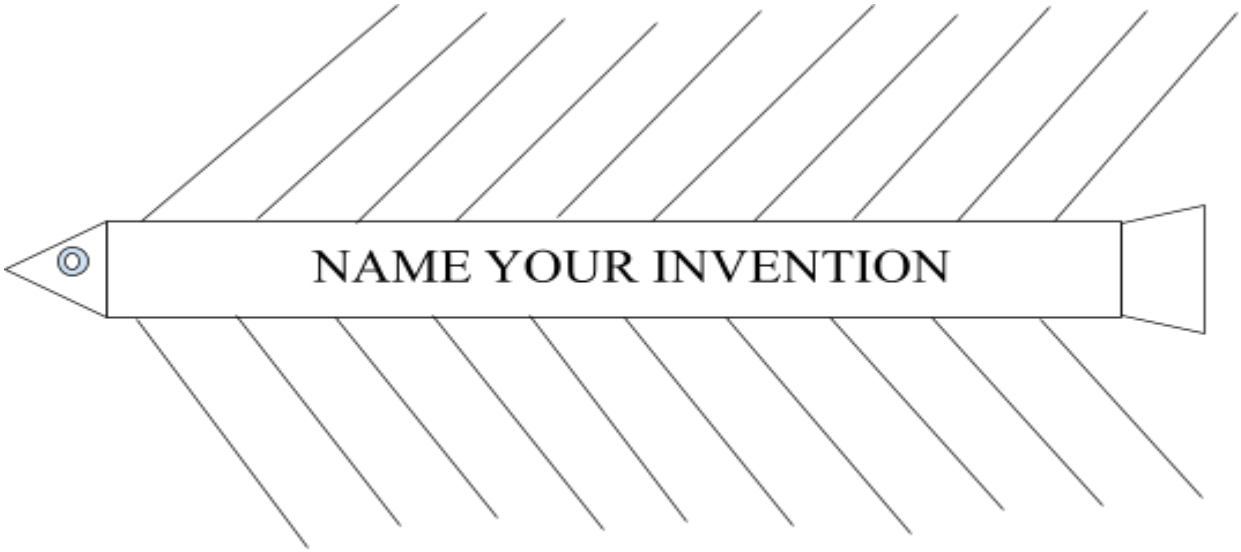
1. NAME your invention. Brainstorm words about your invention. List words or draw ideas around each web.



2. Circle several favorite words or sketches from the webs.
3. Combine and add words until you come up with a name.
4. My **invention** is called**:**

L-II Step 7: COMMUNICATION ~ Share Problem, Solution & Invention Process

1. NAME your **invention**! Brainstorm descriptive words that tell more about the **solution** to your **problem**: function, audience, rhyming words, combinations of words, alternative spelling, numbers, and alliteration (words with the same beginning sounds). Be witty! List words on branches of the fishbone diagram.



2. Circle several favorite words from the web above. Rearrange, add to and try combinations of words in order to create your invention's name. It's important. In the T-chart, write your ideas and take a vote from friends &/or family.

Tally results for a favorite. Most votes wins "best name". Settle any ties.

Idea for Name	Tally # of Votes

(CONTINUED)

➢ Rewrite your **invention's name**:

_____

_____

➢ Reflect on the **highlights of your story**.
➢ How can important ideas be shared on a tri-fold display board?

BEGINNING	MIDDLE	END
Problem: Who/what has the problem? Why is this a problem?	Solution: How does the solution solve your problem? Challenges & successes of building your invention? Changes/modifications to your design?	Prototype (model): Describe the testing process. How did you know your invention worked well? How will your invention help others (humans, animals) or the environment? Who supported you? What do they think about your invention?

(CONTINUED)

WNYiC COMPETITION REQUIREMENTS

All projects MUST have the following to communicate the story of your invention:

- **Tri-fold (3-panel) Display Board** - an organized, visual aid with correct grammar, spelling, and punctuation, along with fonts that are readable (size, style, color)
    - Maximum 24" wide when both wings folded inward (wings should be open during judging) and 36" tall [tabletop-footprint of no more than 30" wide]
    - Student(s) Name(s)
    - Name of Invention
    - Student(s) Grade(s)
    - Student(s) School/Organization
    - City/Town, State
    - Statement of Problem
    - Explanation of Solution to the Problem
    - Details of Invention Design
    - Diagrams/Photos/Drawings of Building, Testing, Research…of Invention
    - Scientific Terms/Principles (e.g. buoyancy)
    - Information about Invention Process, Inventor(s), etc.

- **Prototype** - model of your invention that may be working or non-working
    - Original
    - Show characteristics that make invention useful and valuable
    - Does not need to be fully functional

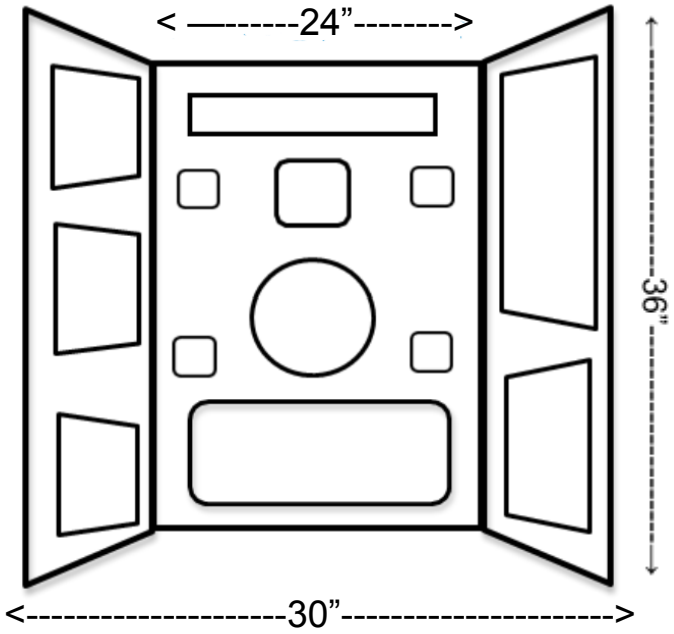
- **Restrictions** - items not allowed on your person or project:
    - Firearms/weapons of any sort or replica, parts of or whole
    - Unnecessarily dangerous or violent items nor the promotion of
    - Balloons, glitter, confetti, perishable products, liquids in open containers
    - Inappropriate racial, gender, political, religious, &/or ethnic language/pics
    - Trademarks/logos, personal identifications (e.g. address, phone #)

  Note: Batteries required for an invention must be provided by the inventor. Electrical outlets and refrigeration are not provided.
- **ONLY qualified inventors competing at the National Invention Convention need to include the WNYiC *Inventor's Guide*** -hardcopy (parts or whole), used throughout the ***7-step invention process***, tri-fold display and 2-4 min. (max. 6 min.) informative video. SEE Official Rules @ **https://inhub.thehenryford.org/**

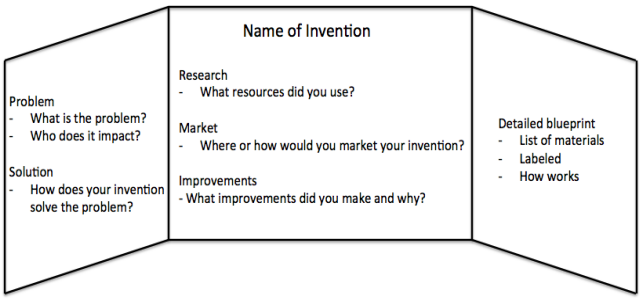
(CONTINUED)

TRI-FOLD (3-PANEL) DISPLAY BOARD

Draft your ideas for an original invention display board on another paper.
Be creative with your design.
Reread competition requirements* often on **Page 16**.



Suggestions for tri-fold display board.



L-I and L-II GLOSSARY OF WORDS*

a-ha - an expression of satisfaction or surprise

alliteration - same letter or sound at beginning of two/more words (e.g. *Kit Kat*)

alternative - another possibility (e.g. *Sno Bal*)

brainstorm - to think of many, new and different ideas

cause - a thing or person that gives rise to an action or effect

cons - disadvantages; “considerations against”; 👎

design - to plan and make decisions about something being created or built

Edward deBono - a Maltese physician and inventor; created “lateral thinking” and Six Thinking Hats to look at problems from different points of view

effect - the result (consequence) of an action or a cause

engineer - a person who invents, designs, builds, tests, and/or maintains machines or structures while considering practicality, regulation, safety, and cost

entrepreneur - person who organizes and operates a business and its finances

experiment - a scientific procedure to make a discovery, test a hypothesis, or demonstrate a fact

fantasy - imagining things, especially the impossible

guide - a direction or a person to show the way for others

L-I and L-II GLOSSARY OF WORDS*

(CONTINUED)

hypothesis - proposed explanation using previous knowledge and limited evidence; a starting point for further investigation

idea - a thought, suggestion or purpose for a possible course of action

improve - to make, become or produce something better

interview - a formal discussion with others to obtain information

invention - action of discovering something or a process that has been created

inventor - a person who creates, especially some new process, item or machine

market - a gathering of people for the sale and purchase of products

mindful - focusing on the moment; slowing down to take the time to be aware

original - created directly and personally; not a copy nor imitation; like no other

patent - a license to have the sole right or title for a set period that excludes others from making, using or selling an invention

perseverance - ability to stick with something for success, regardless of difficulty

perspective - ability to look at things from other people's point of view

pet peeve - a thing that bugs you every time; an annoyance

pitch – short verbal presentation that tells about an idea/product and its benefits

problem - a matter that is unwelcomed and can be solved or overcome

process - steps taken to achieve a goal

professionals - experts in their field of knowledge

pros - advantages; “ considerations for”; 👍

L-I and L-II GLOSSARY OF WORDS*

(CONTINUED)

prototype - an original model, working or non-functional, that represents an actual product; helps an inventor consider different options for design before going to market

realistic - could exist in real life; not fantasy

reflect - to think carefully and deeply; take time to reconsider something

research - the study of materials and sources in order to establish facts and new conclusions

result - an effect; the outcome or consequence of something

sketch - a rough or unfinished drawing

solution - the effect or result of solving a problem

testing - a procedure to establish quality, performance or reliability before something is used

witty - full of clever humor

Add words and meanings that you find helpful and interesting.