# THE INVENTION CONVENTION IN THE CLASSROOM:
## The Basics of Disciplined Creative Thinking for Every Grade Level


**Lesson Plans**

**Homework Assignments**

**Background Information**

**Worksheets**

**Bibliographic Resources**

**Based on the nationally acclaimed Project XL: The Inventive Thinking Curriculum Project published in 1990 by the U.S. Patent and Trademark Office**

Dear Educator,

Welcome to the Inventive Thinking Curriculum! We are pleased to be able to support central Ohio area educators in the vital task of teaching students to think independently, creatively, and productively. We are convinced that the future of the children, and of our community, depends on it.

All of the substantive information and activities in this packet come from the Project XL Inventive Thinking Curriculum Project, which is familiar to many teachers and was developed by the U.S. Patent & Trademark Office. Included in this packet you will find:

- Eight individual lessons to use in your classroom.
- Student handout masters for classroom exercises. Feel free to copy and use them.
- Information on Ohio inventors including female, minority, and children inventors.
- Special information on patents, trademarks and copyrights.

For students to be eligible for the city-wide Invention Convention, they must be registered by your district coordinator. Coordinators have additional information and can answer your questions about the Convention.

We hope you find these materials useful in the classroom, and that you will encourage your students to apply the inventive thinking skills they learn in school to many of the challenges they face in everyday life.

Regards,
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**The Importance of Inventive Thinking**

Why does it seem as though the imagination we all start out with fades as we "grow up" and get practical? It doesn't have to: instead, we can teach children to use that imagination to build a better world. To notice a problem, and fix it. To dream up a way to make life easier, and make it.

To see beyond what is, to what might be. And then do something about it.

That's the kind of disciplined inventive thinking that creates success for students, for companies, and for our nation. It is so important that the government, working through the U.S. Patent and Trademark Office, developed a thorough, thoughtful curriculum to teach Inventive Thinking for use in schools nationwide. Project XL, produced in consultation with educators, inventors, scientists, and other specialists, is the basis of the following materials.

To find out more about the Inventive Thinking educational models upon which this program is based, see:

Bloom, Benjamin. *Taxonomy of Educational Objectives, Handbook 1: Cognitive Domain* (1956).

Heyn, Ernest. *Five of Genius*.

Isaksen, Scott and Donald Treffinger. *Creative Problem Solving: The Basic Course* (1985).

Osborn, Alex. *Applied Imagination*.

Renzulli, Joseph. *Systems and Models for Developing Programs for the Gifted and Talented*, Chapter XI by Calvin Taylor, and summary by Carol Schlicter(1986).

*Talents Unlimited*. National Diffusion Network of the U.S. Department of Education.

Torrance, Paul. *The Search for Satori and Creativity*. (1989).

# LESSON ONE: WHAT IS AN INVENTION?

**LESSON ONE: WHAT IS AN INVENTION?**

**1. Class discussion**

How did successful inventors get their ideas? How did they make their ideas a reality? Have the class read the stories and information that follow and talk about what they learned.

**2. Library work**

Independently or as a class, have students find books about creativity, invention and inventors. Use these as the basis for reports.

**3. Information from a direct source**

Invite a local inventor to speak to the class.

**4. Class Activity**

Have the class inspect the classroom, and other parts of the building if possible, to locate all the inventions they can find. All the inventions in the classroom that have a U.S. PATENT will have a patent number. One such item is probably the pencil sharpener. (For older students, see "Patents in Brief" in Appendix A.)

**5. Homework**

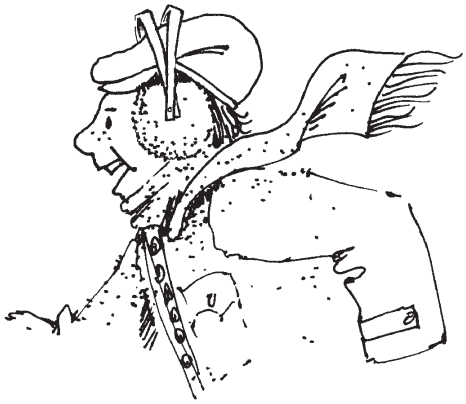
Have the students check out their homes (or other familiar places, such as grocery stores, doctors' offices, etc.) for inventions. Have them make a list, and choose several they think could be improved. How would they improve them?

# MEET THE INVENTORS

## MEET THE INVENTORS

Here are some stories about thinkers and inventors whose work has changed something about our lives. Notice that inventors can be male or female, old or young, minorities or non-minority. Inventors are just ordinary people with dreams and ideas. The only thing that makes them different is their decision to keep working hard on their ideas until they become realities.

## INVENTIONS THAT SOLVE A PROBLEM



### An Ear for Success

The Invention of Earmuffs

Maybe Charlie Greenwood got new skates that winter. Or maybe he just didn't want to go inside and do his homework. Whatever the reason, 13-year old Charlie wanted to protect his ears from the winter cold while he skated. So he found a piece of wire, and with his grandmother's help, padded the ends. In the beginning, his friends laughed at him. However, when they realized that he was able to stay outside skating long after they had gone inside, freezing, they stopped laughing. Instead, they began to ask Chester to make ear covers for them, too. At age 17, Chester applied for a patent. For the next 60 years, Chester's factory made earmuffs, and earmuffs made Chester rich!

### A Cut Above

The First Band-Aid®

At the turn of the century, a young woman named Mrs. Dickson had some trouble learning to cook. She cut and burned herself a lot! Her husband, Earl Dickson, got a lot of practice in hand bandaging! Luckily, his job was with the Johnson & Johnson company, so he knew something about it. But he wasn't always home when his wife cut herself, and he wanted her to have a bandage available at all times. So he began to prepare bandages ahead of time so that his wife could apply them by herself. By combining a piece of surgical tape and a piece of gauze, he fashioned the first crude adhesive strip bandage.


**A Real Hole-in-One**

The Reason We Have Life-Savers®

During the hot summer of 1913, Clarence Crane, a chocolate candy manufacturer, found himself in a quandary. When he tried to ship his chocolates to candy shops in other cities, they melted into gooey blobs. To avoid dealing with the mess, his customers stopped their orders until cooler weather. In order to retain his customers year round, Mr. Crane needed to find a substitute for the melted chocolates. He experimented with hard candy, which wouldn't melt during shipment. Using a machine designed for making medicine pills, Crane produced a small, circular candy with a hole in the middle. And that was the birth of Life Savers!

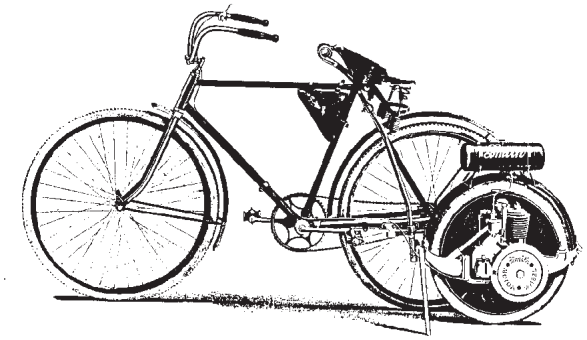
**The Cutting Edge**

How the Frisbee® First Flew

The term "Frisbee" did not always refer to the familiar plastic disk we love to send flying through the air. More than 100 years ago in Bridgeport, Connecticut, William Russell Frisbie owned the Frisbie Pie Company. His pies all were baked in a 10-inch round pie tin with a raised edge, wide brim, six small holes in the bottom, and the words "Frisbie Pies" imprinted on the bottom.

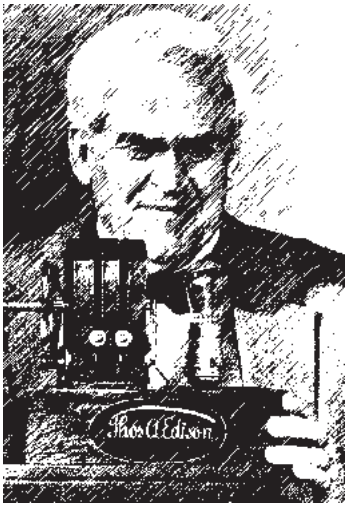
The pie tins flew very well, so playing catch with them soon became a popular sport, especially among college students. However, the tins were slightly dangerous when a toss was missed, so it became a custom at Yale University, in nearby New Haven, to yell "Frisbie" when throwing a pie tin.

It was years later, in the 1940s, when the emergence of plastics made a safe "Frisbie" possible. Today, Frisbee® is a registered trademark of the Wham-O Manufacturing company.



Arthur Garford of Elyria, Ohio,
invented the bicycle seat in the 1890s.

# MEET THE INVENTORS




Thomas Edison held a total of 1,093 patents. (Photo: actor Drew Wilson as Thomas Edison)

## THOMAS EDISON AND OTHER YOUNG INVENTORS

If I were to tell you that Thomas Alva Edison had shown signs of inventive genius at an early age, you probably would not be surprised. Mr. Edison achieved enormous fame with his lifelong contributions of volumes of inventive technology. He received the first of his 1,093 U.S. patents by age 22. In the book *Fire of Genius*, author Ernest Heyn reports on a remarkably resourceful young Edison—though some of his earliest tinkering clearly lacked merit.

By the age of six, Thomas Edison's experiments with fire were said to have cost his father a barn. Soon after that, it is reported that young Edison tried to launch the first human balloon by persuading another youth to swallow large quantities of effervescent powders to inflate himself with gas. Of course, the experiments brought quite unexpected results!

Chemistry and electricity held great fascination for this child, Thomas Edison. By his early teens, he had designed and perfected his first real invention, an electrical cockroach control system. He glued parallel strips of tinfoil to a wall and wired the strips to the poles of a powerful battery—quite a shock for the unsuspecting insect.

As a dynamo of creativity, Mr. Edison stood as decidedly unique; but as a child with a curious, problem-solving nature, he was not alone. Here are some other "inventive children" we have grown to know and appreciate:

- At age 14, one schoolboy invented a rotary brush device to remove husks from wheat in the flour mill run by his friend's father. The young inventor's name? Alexander Graham Bell.
- At 16, another of our junior achievers saved pennies to buy materials for his chemistry experiments. While still a teenager, he set his mind on developing a commercially viable aluminum refining process. By age 25, Charles Hall received a patent on his revolutionary electrolytic process.
- While only 19 years old, another imaginative young person designed and built his first helicopter. In the summer of 1909, it very nearly flew. Years later, Igor Sikorsky perfected his design and saw his early dreams change aviation history.

# MEET THE INVENTORS

Scores of very young childhood problem-solvers abound:

- Fourteen-year old Robert Fulton invented the manually operated paddlewheel;
- Philo T. Farnsworth conceived his optical scanning idea at the tender age of 14. He is now known as the father of TV.

Many adult inventors discovered their first inventions while they were young student's - just like you.

**SOME LOCAL CHILDREN'S INVENTIONS**

**"Eggerrific"** - Chelsey Denz solved the problem of broken egg shells in your eggs. Her "Eggerrific" combined a post (to break eggs against) and a mesh cloth below (to catch the broken bits of eggshell - and strain them out). The invention also included egg tweezers and an egg slicer for use with hard boiled eggs.

Jennifer Srocker's **"Christmas Tree Watering Can"** eliminated the need to ever get stuck by Christmas tree needles ever again. This invention puts distance between your hands and the prickly sharp pine needles - by adding a long handle to a standard watering can.

Losing her house key will never be a problem for Tierra Turner. Tierra's **"Key Band"** solved that problem by attaching a Velcro key pouch to a comfortable wrist band. Her keys will always be as close as you can get to "in your hand."

Thomas Sharkey is one grade schooler who may have a future in Law Enforcement or Security. His custom made **"ATM Glove"** adds a cardboard shield attachment to a regular glove. This creative idea solved the problem of keeping his mom's private PIN number private - by preventing the other bank customers waiting in line behind her from seeing her secret code.

Victoria Vance has made many parents happy - by helping keep their telephone bills down. Her **"Automatic Timer Telephone"** allows you to set the amount of time you want to talk on the phone. The timer automatically hangs up the telephone if you continue to talk past your time limit.

These are just a few of the great inventions developed by local Columbus students just like you at Columbus' first Invention Convention and every one of these students started from the same place - an IDEA.

To be an inventor that is all you need, so...

JUST LOOK, JUST HAVE FUN, and **JUST THINK!!!**

Just Think invention CONVENTION

# MEET THE INVENTORS

## GREAT WOMEN INVENTORS

Inventions tell us something about the society in which the inventor lived, and his or her place in it. By looking at the invention, we can often deduce what problems the inventor faced, and what skills he or she had. It is not surprising that up until the middle of this century, women's inventions were often related to child care, housework, and health care—all traditional female concerns. In recent years, with access to specialized training and broader job opportunities, women have been applying their creativity to many new kinds of problems, including those requiring advanced technology.

While women have frequently come up with new ways to make their work easier, they have not always received credit for their ideas. Some stories about early women inventors show that women often recognized that they were entering a "man's world," and shielded their work from the public eye by allowing men to patent their inventions. Here are some examples:


- Margaret Knight, remembered as the "female Edison," received some 26 patents for such diverse items as a window frame and sash, machinery for cutting shoe soles, and improvements to the internal combustion engine. Her most significant patent was for machinery that would automatically fold and glue paper bags to create square bottoms, an invention which dramatically changed shopping habits. Workmen reportedly refused her advice when first installing the equipment because, "after all, what does a woman know about machines?"

- Sarah Breedlove Walker, the daughter of former slaves, was orphaned at seven and widowed by 20. Madame Walker is credited with inventing hair lotions, creams, and an improved hair styling hot comb. But her greatest achievement may be the development of the Walker system, which included a broad offering of cosmetics, licensed Walker agents, and Walker schools, which provided meaningful employment and personal growth to thousands of Walker agents, mostly African-American women. Sarah Walker was the first American woman self-made millionaire.

- Bette Graham hoped to be an artist, but circumstances led her into secretarial work. Bette, however, was not an accurate typist. Fortunately, she recalled that artists could correct their mistakes by painting over them with gesso, so she invented a quick-drying "paint" to cover her typing mistakes. Bette first prepared the secret formula in her kitchen, using a hand-mixer, and her young son helped to pour the mixture into little bottles.

## MEET THE INVENTORS

In 1980, the Liquid Paper Corporation which Bette Graham built was sold for more than $47 million.

- Stephanie Kwolek, one of Dupont's leading chemists, discovered the "miracle fiber" Kevlar, which has five times the strength of steel by weight. Uses for Kevlar are seemingly endless, including ropes and cables for oil-drilling rigs, canoe hulls, boat sails, automobile bodies and tires, and military and motorcycle helmets. Many Viet Nam veterans and police officers are alive today because of protection provided by bullet-proof vests made from Kevlar. Because of its strength and lightness, Kevlar was chosen as the material for the Gossamer Albatross, a pedal airplane flown across the English Channel.
- Gertrude B. Elion, 1988 Nobel Laureate in medicine, and Scientist Emeritus with Burroughs Wellcome Company, is credited with the synthesis of two of the first successful drugs for leukemia, as well as Imuron, an agent to prevent the rejection of kidney transplants, and Zovirax, the first selective antiviral agent against herpes virus infections. Researchers who discovered AZT, a breakthrough treatment for AIDS, used Elion's protocols.

And here are a few more interesting facts about women inventors:

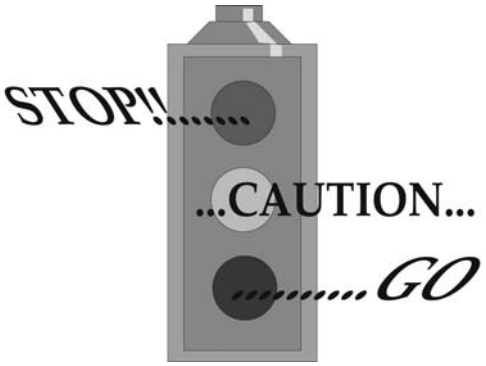
- Windshield wipers were patented by Mary Anderson in 1903.
- Dandruff shampoo was patented by Josie Stuart in 1903.
- A dishwasher was patented by Josephine Cochrane in 1914.
- The first disposable diaper was patented by Marion Donovan in 1951.
- A compact portable hair dryer was patented by Harriett J. Stern in 1962.
- A dough product for frozen pizza was patented by Rose Totino in 1979.
- The Melitta Automatic Drip Coffee Maker was patented by Melitta Benz in Germany in 1908.

# MEET THE INVENTORS

## GREAT MINORITY INVENTORS

Between 1863 and 1913, approximately 1,200 inventions were patented by African American inventors. Many more were unidentified because they hid their race to avoid discrimination. Some sold their inventions to white men. The following stories are about a few of the great minority inventors. To learn more, you can obtain the film *From Dreams to Reality: a Tribute to Minority Inventors*, at no charge, from the Patents and Trademark Office. You can request this video from your local Patent Depository Library, or by writing to: The Office of Equal Employment Programs, U.S. Patent and Trademark Office, Crystal Park 1, Room 600, Washington, D.C. 20231 (703) 557-1692.

Here are some stories about great American minority inventors:




- Elijah McCoy may well have been the real "real McCoy." Why? McCoy earned about 50 patents, but the most famous one was for a metal or glass cup that fed oil to bearings through a small-bore tube. Machinists and engineers who wanted genuine McCoy lubricators may have originated the term "the real McCoy." Elijah McCoy was born in Ontario, Canada, in 1843, the son of slaves who had fled Kentucky. He died in Michigan in 1929.
- Benjamin Banneker created the first striking clock made of wood in America. He became known as the "Afro-American Astronomer." He published an almanac and with his knowledge of mathematics and astronomy, assisted in the surveying and planning of the new city of Washington,D.C.
- Granville Woods had more than 60 patents. Known as the "Black Edison," he improved Bell's telegraph and created an electrical motor that made the underground subway possible. He also improved the airbrake.
- Garrett Morgan invented the traffic signal that has saved millions of lives since the automobile became popular. He also invented a safety hood for firefighters.
- George Washington Carver changed the South with his many inventions. He discovered more than 300 different products made from the peanut, which had been considered a lowly food fit only for hogs. He dedicated himself to teaching others, learning and working with nature. He created more than 125 new products with the sweet potato, and taught poor farmers how to rotate crops to improve their soil and their cotton. George Washington Carver was a great scientist and inventor who

# GREAT OHIO INVENTORS

## GREAT OHIO INVENTORS

History is filled with pages of famous Ohio inventors and their inventions. Most famous, of course, is Thomas Edison. What you may not know about are the hundreds of "not-so-famous" Ohio inventors working and inventing all around us right now everyday. Some are right here in Columbus, and some started out when they were young students just like you. Here are some examples:

- Charles Franklin Kettering, a 1904 graduate of **Ohio State University,** invented the first electrical ignition system and the self starter for automatic engines. He is responsible for the first practical engine driven generator, and went on to work on the development of the electronically operated cash register. Later in life, the research labora -tory he set up at General Motors developed the refrigerant Freon, four-wheel brakes, safety glass, and the lightweight diesel engine that made the diesel locomotive possible.
- William Merium Burton - born in **Cleveland** - began his career at Standard Oil of Cleveland as a chemist. His laboratory research and test work on refining crude oil led to the first commercially successful process for cracking crude oil into gasoline and other products. His process doubled the yield of crude oil, saving more than 1 billion barrels during the first 15 years.
- Eight months after his graduation from **Oberlin College**, in the collage laboratories, Charles Martin Hall discovered an inexpensive method for extracting pure aluminum from its ore. His discovery led to mass production of the metal - and a wide commercial use of what we now call aluminum foil.
- We owe our non-stick pans to another Ohio native - chemist Roy J. Plunkett. Born in New Carlisle Ohio - this **Ohio State alumni** discovered Teflon while working on refrigerants as a chemist at Dupont.
- Edward Morley collaborated with Albert A. Michelson on an historic experiment. The Michelson-Morley experiment marked the birth of modern physics in America, showing that the speed of light is unaffected by the movement of the earth through space. This experiment paved the way for Einstein's Theory of Relativity.
- The inventor of the commercial antihistamine agent, Benadryl, George Rieveschl was born in **Arlington Heights, Ohio**, and received his undergraduate and graduate degrees from the **University of Cincinnati.**
- Becky Schroeder at the **age of 10** invented a "luminescent backing sheet for writing in the dark" and at the age of 12 she received her first patent for this device. The invention is a self- illuminated phosphorescent clip board which allows for writing in the dark.

# LESSON TWO: HOW TO BEGIN INVENTING

learned to be a careful observer and who was honored throughout the world for his creation of new things.

## LESSON TWO: HOW TO BEGIN INVENTING

### 1. Class Activity: Brainstorming

Brainstorming is a process of spontaneous thinking used by an individual or by a group of people to generate numerous alternative ideas while deferring judgment. Introduced by Alex Osborn in his book, *Applied Imagination*, brainstorming is the crux of each of the stages of all problem-solving methods.

You may want to copy the "rules" for brainstorming on the next page for your students, or even create a poster to remind them of the fundamentals for successful creative thinking!

To practice, simply pick a problem, or have the class select one, and let the fun begin! This is a good time to apply your imagination curriculum to other subjects the class may be studying in science, social studies, or literature: you can brainstorm on anything from different endings for a book you've read, to solving the health care crisis, to increasing the effectiveness of your school's student government association. Younger students may like to brainstorm on how to improve

# LESSON TWO: HOW TO BEGIN INVENTING

lunch, or how to get dressed quickly in the morning. Whatever the topic, be sure to keep a record of the ideas for later assessment and elaboration!

**WE'RE HAVING A BRAINSTORM!**

**No Criticism Allowed!**

People tend to evaluate each suggested idea automatically—in fact, many ideas often go unsaid because of mental pre-judgment. Both internal and external criticism are to be avoided while brainstorming. Neither positive nor negative comments are allowed. Either type inhibits the free flow of thought and requires time which interferes with the next rule. Write each spoken idea down as it is given and move on.

**Work for Quantity!**

Alex Osborn states that "Quantity breeds Quality." People must experience a "braindrain" (get all the easy or common responses out of the way) before the innovative, creative ideas can surface; therefore, the more ideas, the more likely there are to be quality ideas among them.

**Hitchhiking Welcome!**

Hitchhiking occurs when one member's idea produces a similar idea or an enhanced idea in another member. All ideas should be recorded.

# LESSON TWO: HOW TO BEGIN INVENTING

**Freewheeling Encouraged!**

Outrageous, humorous, and seemingly unimportant ideas should be recorded. It is not uncommon for the most "off-the-wall" comment to be one wherein lies a solution for the problem.

**2. Discussion/Homework: Getting Control of Ideas**

Have pairs or small groups of students choose a particular idea from the brainstorming list and use the principals below to add the flourishes and details that would develop the idea more fully.

Allow the students to share their innovative and inventive ideas!

This description of Creative Thinking Processes comes from Paul Torrance in *The Search for Satori and Creativity*.

Fluency.....the production of a great number of ideas.

Flexibility.....the production of ideas or products that show a variety of possibilities or realms of thought.

# LEARN TO SCAMPER!

Originality.....the production of ideas that are unique or unusual.

Elaboration.....the production of ideas that display intensive detail or enrichment.

**3. Class Activities: SCAMPER!**

Bob Eberle's SCAMPER technique for inventive thinking can take your class a step farther along the path to the creation of a truly workable new invention. Instead of commands, SCAMPER is based on questions students can ask themselves about an object or idea, using brainstorming techniques to come up with answers.

To help students understand how the questions work, have them look back at some of the inventor stories in Lesson 1. See how those inventors applied questions like those in SCAMPER.

Charles Hall was the Oberlin professor who found the way to make aluminum a common metal.

# LEARN TO SCAMPER!

**THE SCAMPER QUERIES**

Ask these questions about an object or idea, and see what you invent!

**Substitute?**
Who else instead? What else instead? Other ingredient? Other material? Other power? Other place?

**Combine?**
How about a blend, an alloy, an ensemble? Combine purposes? Combine appeals?

**Adapt?**
What else is like this? What other idea does this suggest? Does the past offer a parallel? What could I copy?

**Minify?**
Odor, form, shape? What to add? More time?

**Magnify?**
Greater frequency? Higher? Longer? Thicker?

**Put to New Uses?**
New ways to use as is? Other uses if modified? Other places to use? Other people to reach?

**Eliminate?**
What to subtract? Smaller? Condensed? Miniature? Lower? Shorter? Lighter? Omit? Streamline? Understate?

Interchange components? Other pattern?
**Reverse?**

**rearrangE?**
Other layout? Other sequence? Transpose cause and effect? Change pace? Transpose positive and negative? How about opposites? Turn it backward? Turn it upside down? Reverse roles?

# LESSON TWO: HOW TO BEGIN INVENTING

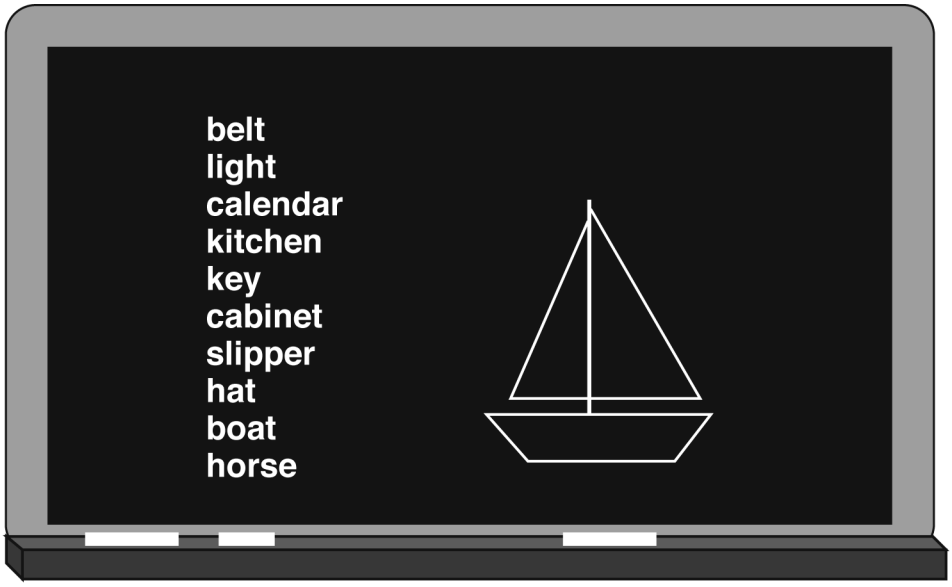
**4. SCAMPER Activities**

A. Bring in any object or use objects around the classroom to do the following exercise. Ask the students to list many new uses for a familiar object, using the SCAMPER technique. You could use a paper plate or a craft stick to begin with, and see how many new things the students will discover. Make sure to follow the rules for brainstorming!

B. Using literature, ask your students to create a new ending to a story, change a character or situation within a story, or create a new beginning for the story that would result in the same ending.

C. Put a list of objects on the chalkboard. Ask your students to combine them in different ways to create a new product.

For homework/in-class exercise, let the students make their own lists of objects. Once they combine several of them, ask them to illustrate the new product and explain why it might be useful.



# LESSON THREE: PRACTICING INVENTIVE THINKING

**LESSON THREE: PRACTICING INVENTIVE THINKING**

1. In-Class Activity

   Before your students begin to find their own problems and create unique inventions or innovations to solve them, you can assist them by taking them through some of the steps as a group.

A. Finding the Problem

   Let the class list problems in their own classroom that need solving. Use the "brainstorming" technique from Lesson l. Perhaps your students never have a pencil ready, as it is either missing or broken when it is time to do an assignment. Select one problem for the class to solve using the following steps:

   a. Find several problems. Select one to work on.

   b. Analyze the situation.

   c. Think of many, varied, and unusual ways of solving the problem.

List the possibilities. Be sure to allow even the silliest possible solution, as creative thinking must have a positive, accepting environment in order to flourish.

B. Finding a Solution

   a. Select one or more possible solutions to work on. You may want to divide into groups if the class elects to work on several of the ideas.

   b. Improve and refine the idea(s).

   c. Share the class or individual solution(s)/invention(s) for solving the class problem.

Solving a class problem and creating a class invention will help students learn the process and make it easier for them to work on their own invention projects. Or, you may want to move ahead and build your class invention for a group presentation.

# LESSON FOUR: DEVELOPING AN INVENTION IDEA

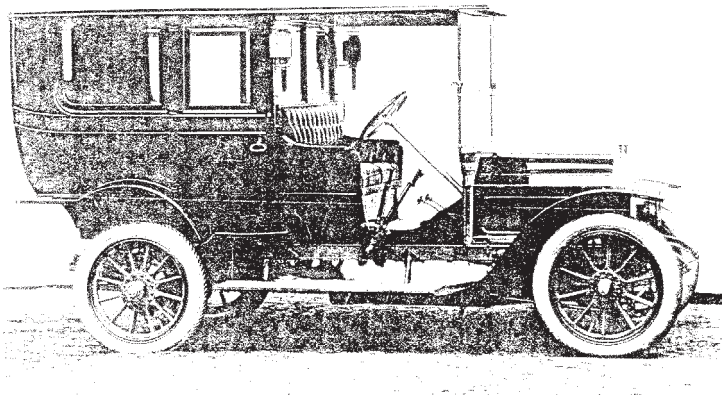
**LESSON FOUR: DEVELOPING AN INVENTION IDEA**

Now that your students have had an introduction to the inventive process, it is time for them to find a problem and create their own invention to solve it.

1. Homework

   Begin by asking your students to conduct a survey. Tell them to interview everyone that they can think of to find out what problems need solutions. What kind of invention, tool, game, device, or idea would be helpful at home, work, or during leisure time? (There is a sample survey on the next page you can copy for your students to use.)

2. Ask the students to list the problems that need to be solved.



The same Arthur Garford who invented the bicycle seat later teamed up with Clement Studebaker to revolutionize the auto industry by using aluminum alloy.

# INVENTION QUESTIONNAIRE

**Invention Questionnaire**

1. What does not work as well as you would like it to work? _____

2. What job(s) would you like to see done? _____

3. What problem(s) would you like to see solved? _____

4. If you could invent something to make your life easier, what would you invent? _____

5. What is the most annoying problem

   at home? _____

   at school? _____

   at work? _____

   at the airport? _____

   on the road? _____

   at the supermarket? _____

   at the bank? _____

   at the shopping center? _____

   at _____?

# LESSON FOUR: DEVELOPING AN INVENTION IDEA

**3. In-Class Writing Activity and Discussion**

Next comes the decision-making process.

a. Using the list of problems, ask the students to think of which problems would be possible for them to work on. They can do this by listing the pros and cons for each possibility.

b. Predict the outcome or possible solution(s) for each problem.

c. Make a decision by selecting one or two problems that provide the best options for an inventive solution.

(The decision-making process can be assisted by using the Planning and Decision-Making Framework copymaster on the next page.)

# Planning And Decision-Making Framework

**Planning And Decision-Making Framework**

PROBLEM: What is the dilemma?

SOURCES OF INFORMATION: List the primary and secondary sources of information.

People (primary):

Books, Films, Places, etc. (secondary):

ALTERNATIVES: Generate a list of possibilities.

PROS & CONS: What reasons support and do not support the possibilities?

PROS:

CONS:

FINAL PRODUCT: What form will it take? How will the results be communicated?

CRITERIA: List the criteria for judging the alternatives.

DECISION: What is the final decision? Why?

SPECIAL EQUIPMENT: List all items such as a tape recorder, construction materials, etc., that may be required.

RESULTS: How did the plan work? What modifications, if any, took place?

# LESSON FOUR: DEVELOPING AN INVENTION IDEA

**4. Home/School Ongoing Activity**

Have the students keep an Inventor's Log or Journal. A record of ideas and work accomplished is very important to real inventors: more than once, an original inventor has lost ownership of a patent because of poor record-keeping!

For example, long before Alexander Graham Bell filed a patent application in 1875, Daniel Drawbaugh claimed to have invented the telephone. But since he had no journal or record, the Supreme Court rejected his claims by four votes to three. Alexander Graham Bell had excellent records and was awarded the patent for the telephone.

You may want to copy and distribute the sample log sheet on the next page, or just have students keep a special notebook for this purpose.

**Rules For Authentic Journal Keeping**

1. Using a bound notebook, make notes each day about the things you do and learn while working on your invention.
2. Record your idea and how you got it.
3. Write about problems you have and how you solve them.
4. Write in ink and do not erase.
5. Add sketches and drawings to make things clear.
6. List all parts, sources, and costs of materials.
7. Sign and date all entries at the time they are made and have them witnessed.

# YOUNG INVENTOR'S LOG


**Young Inventor's Log**

A log is a diary and a record of your inventive thinking. It should include everything that is related to your project. Every time you write in the log, you should initial and date your entry and also have it signed by a witness. A witness can be anyone who knows what you are working on that day–mom, dad, friend, brother, sister, etc. The list below includes some of the items that might be recorded in your log; you will think of others. Remember, every time you work on your project or just think about your idea, you should record it in your inventor's log or notebook.

**Ideas for Inventions:**

Problems:

Possible Solutions:

Plans:

1. What am I going to invent?
2. What steps will I need to take?
3. What materials will I need? What will the materials cost?
4. What problems might occur?
5. How will I present my project?

**Resources:**

1. Books?
2. Other References?
3. People?

**Drawings of Possible Solutions:**

Results of Interviews:

Results of Surveys:

Other:

# LESSON FIVE: BRAINSTORMING FOR CREATIVE SOLUTIONS

## LESSON FIVE: BRAINSTORMING FOR CREATIVE SOLUTIONS

Now that the students have one or two problems to work on, they must take the same steps that they did in solving the class problem in Lesson Three. These steps could be listed on the chalkboard or a chart.

1. Analyze the problem(s). Select one to work on.
2. Think of many, varied, and unusual ways of solving the problem. List all of the possibilities. Be non-judgmental. (See "Brainstorming" in Lesson One and SCAMPER in Lesson Two.)
3. Select one or more possible solutions to work on.
4. Improve and refine your ideas.

Alexander Wenton was the Cleveland bicycle repairman who made and sold the first reliable auto in 1898.

# LESSON SIX: PRACTICING THE CRITICAL PART OF INVENTIVE THINKING

## LESSON SIX: PRACTICING THE CRITICAL PART OF INVENTIVE THINKING

Now that your students have some exciting possibilities for their invention projects, they will need to use their critical thinking skills to narrow down the possible solutions. They can do this by asking themselves the following questions about their inventive idea:

1. Is my idea practical?
2. Can it be made easily?
3. Is it as simple as possible?
4. Is it safe?
5. Will it cost too much to make or use?
6. Is my idea really new?
7. Will it withstand use, or will it break easily?
8. Is my idea similar to something else?
9. Will people really use my invention? (Survey your classmates or the people in your neighborhood to document the need or usefulness of your idea.)

# LESSON SEVEN: COMPLETING THE INVENTION

**LESSON SEVEN: COMPLETING THE INVENTION**

When students have an idea that meets most of the qualifications in Lesson Six, they need to plan how they are going to complete their project. Following a systematic planning technique will save them a great deal of time and effort. The following pattern, combined with use of the Inventor's Log and/or the Planning And Decision-Making Framework in Lesson Four, should help:

1. Identify the problem and possible solution. Give your invention a NAME.
2. List the materials needed to illustrate your invention and to make a model of it. You will need paper, pencil and crayons or markers to draw your invention. You might use cardboard, paper, clay, wood, plastic, yarn, paper clips, and so forth to make a model. You might also want to use an art book or a book on model-making from your school library.
3. List, in order, the steps for completing your invention.
4. Think of the possible problems that might occur. How could you solve them?
5. Complete your invention. Ask your parents and teacher to help with the model.

**REMEMBER TO ANSWER THESE BASICS CLEARLY!**

- WHAT - Describe the problem.
- MATERIALS - List the materials needed.
- STEPS - List the steps to complete your invention.
- PROBLEMS - Predict the problems that could occur.

# LESSON EIGHT: NAMING THE INVENTION

**LESSON EIGHT: NAMING THE INVENTION**

An invention can be named in one of the following ways:

1. Using the inventor's name

   - Levi Strauss: LEVI'S® jeans
   - Louis Braille: Braille Alphabet System

2. Using the components or ingredients of the invention

   - Root Beer
   - Peanut Butter

3. With initials or acronyms

   - IBM® (International Business Machines)
   - ATM (Automatic Teller Machine)

4. Using word combinations (notice repeated consonant sounds and rhyming words)

   - KIT KAT®
   - HULA HOOP®

5. Using the product's function

   - DUSTBUSTER®
   - vacuum cleaner
   - hairbrush
   - earmuffs

6. Using a related image or idea

   - Apple/Macintosh® computers
   - Ivory® soap

Students can be very ingenious about inventing names for products. Older students may benefit from making a distinction between an appropriate brand name and a generic name for an invention.

Solicit their suggestions on a name for the class invention, and have them explain what makes each name effective. Each student should generate names for his or her own invention.

**CARDINAL HEALTH –**
**Inventing your way to Healthy Living.**

Before you get started on your great ideas, let's talk about inventing!

Inventors invent by following certain basic steps - just like many other things you do every day. Like following a recipe while cooking, brushing your teeth or tying your shoes - inventing is a process. To help you get started with YOUR invention – just follow these steps!

**First – JUST THINK!!**

BRAINSTORM!!
How do you come up with the next great 'health' related invention? You brainstorm!

Brainstorming is thinking up new ideas. When you brainstorm - you think of every thing you possibly can about what problems you might have, who has them, how to solve them…everything that enters your mind. Don't worry about every detail – just write down your ideas. You can figure out the 'how' and 'what' later.

You can start by asking yourself the following questions:
(Remember to write down the answers in your journal):

- What are some health problems YOU have? What about your friends? Your Grandmother or Grandfather? Your teachers?
- Now – pick one that you thing you could help solve.
- Is it going to be a 'thing' – a real invention – or a 'process' – like a series of moves/jumps/maneuvers that you do with a certain object?
- What does it look like? Who uses it? When do you use it? At night or in the daytime? In the warm weather or cold?
- Is it like anything you already know about? How is your idea different?

These are all important things to think about when getting ready to make your invention. There really is a lot to think about – but just like exercise - if you just GET STARTED you'll be on your way to 'Inventing Good Health!!'

**Use the SCAMMPER technique to brainstorm! Take your idea – then SCAMPER!!!**

Substitute –What else could you do instead? Can you use another material?
Combine – How about a blend of two or more ideas/processes?
Adapt – What is there already that helps you get healthy? Could I make it better?
Minify – Order, form, shape? Could I make it smaller? Miniature? Portable?
Magnify – Greater frequency? Bigger? Longer? Add something?
Put to other uses – How else could I use it? Or where? With who?
Eliminate – What do I need to get rid of? Subtract? Condense?
Reverse – Will it work backwards, inside out, upside down?

**Second: JUST BUILD!!**

BUILD!!
Once you've decided on your favorite idea - it is time to start defining the pasts and pieces you will need to know to actually make it. You'll need to think about what it will look like, how you will use it , does it need 'directions' – all the things that will help other kids know what YOUR 'Healthy Living' invention is all about – so they can use it – and help others learn how.

Here are a few questions to answer to get you started:
- What are some names your 'Healthy Living' invention might be called?
- How will you use it?
- How many people can use it at one time? One, many, both?
- Does your invention need directions or instructions?
- What are they?
- What Health Problem/Challenge does your invention help solve? How?
- What does it look like?
- How does it operate?

You can draw or sketch your idea – or simply describe it in your inventor's journal. And if you need to - you can make up a set of 'directions' – a 'Healthy Living Roadmap'. (Don't worry – this is easier than it sounds. Remember – this is YOUR idea – so YOU just have to explain what is in your brain.) Write down everything people will need to know –and there it is.

**Finally: JUST BELIEVE!!**

**BELIEVE!!**
Now - you need to actually make your idea into a working model – so you can see what it really looks like and show how it really helps people live healthier lives.

Don't forget – The first thing you should do – EVERY DAY and EVERY STEP OF THE WAY – is write down what you've done in your journal - the improvements, changes, trials and errors – including the DATES you've made them.

**Step 4: Try it out!! – 1-2-3 - and see what happens! Four!! (Score!!!)**
Try your invention – and track your results. The best way to find out if your invention works is to record and track your results. Its really pretty easy – and easy as 1-2-3…….4!!!!

1) DEFINE: Define your specific 'Health Problem/Challenge' (being short of breath):

2) GOAL: Define what you want to accomplish (easier breathing); and how you will measure it (heart/pulse rate);

3) TRY TRY TRY: Test out your idea/invention. Try making it better. Try making it the best!

4) RESULTS: What results did YOUR invention produce?!?!? Did you SCORE!!!?

**CARDINAL HEALTH –**
**WHATS YOUR HEALTH PROBLEM?!?!??!**

Now that you've got YOUR idea underway – and are ready to become Ohio's next great Inventor of Healthy Living - lets see how much you know about health problems and what has been invented to solve them already by inventors in our great State….

First things first –
Before you can invent anything - you need to know what problem you are going to solve.
After all that is where it all starts – right?

**WHAT'S YOUR PROBLEM?!?!?**
What are some of the top health problems facing you and your classmates?
1)
2)
3)

**WHAT'S THEIR PROBLEM?**
How about your Mom & Dad?
1)
2)
3)

**What about your Grandmother & Grandfather?**
1)
2)
3)

**GOOD HEALTH is EVERYONE'S problem!!!**
Some health problems face ALL of our family members…no matter what their age. The most important thing about 'Healthy Living' is that you are never too old to start!! Some health problems can be totally prevented in older people like by learning to solve them when you are young!!

You can start your way to "Healthy Living' RIGHT NOW – whether you are 8 or 80 - and still; make a difference – maybe even prevent some illnesses from even occurring – all you need to do is START……

Need some inspiration???? These Ohio Inventors took the challenge – and their inventions have CHANGED LIVES…..even SAVED LIVES.

**WHO SOLVED THESE PROBLEMS?!?!?!? TEST YOUR "Healthy Living" IQ .....for Ohio.**
1) Which Medical Society was organized in 1849?

2) Who was the 'Benjamin Franklin of Cincinnati…one of the early champions of medical education – and who founded the Ohio Medical College

3) One of the worlds largest and busiest health centers suffered 2 explosions – killing 123 people and sickened 50 more – in 1929. The explosions remain unsolved – but occurred where nitrocellulose X-rays were stored – which emit toxic gases. This tragedy inspired the creation of less flammable cellulose triacetate safety film. Name the health center…

4) What city is known as the 'Cradle of Dental Education/Health'?

5) Where is the nation's largest independent research organization?
ANS:
1) The Ohio State Medical Society.
2) Dr. Daniel Drake
3) Cleveland Clinic
4) Bainbridge, Ohio
5) Columbus, Ohio; Battelle

Ohio has always led the way - 'Inventing the Way to Healthy Living'….
How many answers did YOU know?

**RESEARCH ACTIVITY:**
Find 10 more Ohio inventions – directly related to HEALTH.

| | Invention | Inventor | Where you found it |
|---|---|---|---|
| 1) | | | |
| 2) | | | |
| 3) | | | |
| 4) | | | |
| 5) | | | |
| 6) | | | |
| 7) | | | |
| 8) | | | |
| 9) | | | |
| 10) | | | |

***WHAT IS THE MOST IMPORTANT THING ABOUT HEALTHY LIVING??????***

***YOU LIVE LONGER!!!!!!***

**CARDINAL HEALTH –**

**WINNING IDEAS!!!!**
With 'Healthy Living' EVERYONE WINS!!!!

Young inventors have already invented some really cool and helpful 'Health Related' inventions…..many RIGHT HERE in Ohio – and as a part of the Invention Convention.

**That means YOU can do it TOO!!!**

Lets see if you can tell which ideas were invented by ADULTS and which ones were invented by YOUNG PEOPLE – just like you…..

1) PROBLEM: Kids don't like having their temperature taken.
   SOLUTION: Lollipop Thermometer Sucker
   ADULT/YOUTH????

2) PROBLEM: Can't tell whether your pulse is too fast or too slow;
   SOLUTION: PULSE ALERT
   ADULT/YOUTH???

3) PROBLEM: Pills coming out of the bottle too fast – getting dropped – and lost.
   SOLUTION: One-by-One Pill Dispenser
   ADULT/YOUTH?????

4) PROBLEM: Can't tell if the leftovers have spoiled – has bacteria.
   SOLUTION: Anti-Bacterial Food Wrap.
   ADULT/YOUTH????

5) PROBLEM: Can't get the cotton out of the pill bottle.
   SOLUTION: Cotton Ball Remover.
   ADULT/YOUTH????

6) PROBLEM: Can't read the tiny type on the prescription bottle.
   SOLUTION: Magnifying Prescription Reader
   ADULT/YOUTH???

7) PROBLEM: Can't swallow aspirin well;
   SOLUTION: Transdermal Aspirin Patch.
   ADULT/YOUTH???

8) PROBLEM: Kids lose Emergency ID bracelets.
   SOLUTION: Emergency Alert Patch.
   ADULT/YOUTH????

9) PROBLEM: Casts make it hard to sleep and often bang up your other limb.
SOLUTION: Pillow Cast.
ADULT/YOUTH????

10) PROBLEM: YOUR PROBLEM!!!
SOLUTION: YOUR SOLUTION
ADULT/YOUTH??? YOU!!!!!!!!!!!!!!!!!!!

Well – ALL of these were invented by kids – and ALL of these kids invented them as part of the Invention Convention!!!! Now – do you think you can do it?

**BRAINSTORM ACTIVITY:**

Take each of the above problems – and think of how you could solve them in a DIFFERENT WAY!!

1) Taking Kids Temperatures
2) Pulse Rate Gage
3) Pills Coming out too fast!
4) Safe leftovers?
5) Stuck Cotton Balls.
6) Can't read prescription bottle.
7) Aspirin hard to swallow.
8) MED ID Bracelets getting lost
9) Uncomfortable Casts.
10) YOUR IDEA!!!

**GOOD HEALTH is EVERYONE'S problem!!!**

Some health problems face ALL of our family members…AT ANY AGE.

But INVENTORS are also solving them…. AT ANY AGE.

Ohio has always led the way - 'Inventing the Way to Healthy Living'….AT ANY AGE.

Get started NOW!!!!

**BECAUSE - THE MOST IMPORTANT THING ABOUT HEALTHY LIVING IS…..**

**YOU'LL LIVE BETTER……AT ANY AGE!!!!!**

**INVENTING ENVIRONMENTAL SOLUTIONS TO GLOBAL PROBLEMS – Environmental Ideation – Module #1**

Before you get started on your great environmental ideas, lets take a minute to think about the many different environments there are…

You can start by asking yourself the following questions: (Remember to write down the answers as you go):

- First - name all of the different environments you can think of…?
    - Outside, inside
    - In buildings, in nature
    - In cars, in classrooms
    - In YOUR city, state, country
    - In other cities, states, countries
- Choose which environment you want your invention to try to improve.
- Now – write down every thing about that environment that you think needs to be improved?
    - Better air quality
    - Cleaner water
    - Better waste management
    - Less noise
    - More 'people friendly' conditions
    - What do YOU think?!?!?
- Pick the ONE environment you think YOU could improve on with an invention.
- Then pick the ONE environmental condition you think could be better…..
- That's the problem your Environmental Invention should solve…

Next– we're up to your actual invention…..

- Is it going to be a 'thing' that makes your environment better all on its own?
- Or do you use it along with something else?\
- Is it a PROCESS of doing things?
- Is it a combination of both?

These are all important things to think about when getting ready to make your invention. There is a lot to think about – but the better you are at defining your PROBLEM – the EASIER is will be to turn your idea into a effective environmental improvement - and one that makes EVERYONE's environment better.

[Sidebar:]
Use the **SCAMMPER** technique to brainstorm! Take your idea – then SCAMPER!!!

**Substitute** –What could you do instead? Can you use another material/process?
**Combine** – How about a blend of two or more ideas/processes?
**Adapt** – What already improves the environment? Can you make it better?
**Minify** – Could you make it smaller? Miniature? Portable?
**Magnify** – Greater frequency? Bigger? Longer? Add something?
**Put to other uses** – How else could you use it? Or where? With who?
**Eliminate** – What do I need to get rid of? Subtract? Condense?
**Reverse** – Will it work backwards, inside out, upside down?

**INVENTING ENVIRONMENTAL SOLUTIONS TO GLOBAL PROBLEMS**
**Environmental Ideation - #1 cont'd**

**Second: BREAK IT DOWN!!**
Once you've decided on your favorite idea - it is time to start defining the parts and pieces you will need to turn it from an idea into a real invention that will REALLY IMPROVE the ENVIRONMENT.

You'll need to think about what it will look like, how you will use it, does it need 'directions?', do you use it WITH something else – or on its own?…..all the things that will help everyone know what YOUR 'Environmental Improvement Invention' is all about – so they can use it to make their environments better too.

Here are a few questions to answer to get you started:

- What are some names your 'Environmental Invention' might be called?
- How do people use it?
- How many people can use it at one time? One, many, both?
- Does your invention need directions or instructions?
- What are they?
- What specific environment does your invention improve? How?
- What does it look like?
- What is it made of? What materials?
- What are the parts and pieces?
- How does it work?

You can draw or sketch your idea or you can even make up a set of 'directions', an Environmental Inspiration Manual'. (Don't worry – this is easier than it sounds. Remember – this is YOUR idea – so you just have to write down everything you would tell people if they were there talking with you - and there it is).

**Finally** -
You need to see if your Environmental Innovation really works – if it really IMPROVES your environment.

The best way to find out if your invention works is to record and track your results:

1) DEFINE - your problem: "Cars put out too much exhaust into the atmosphere…..add to pollution – which hampers safe air.

2) DEFINE – your goal: "Making cars in a way that they produce less pollution."

3) DEFINE – your measure of success: "How much less exhaust did your system create."

4) DEFINE – how to test your invention: "Test the air around cars with and without your Environmental Innovation Invention installed."

5) RESULTS ?!?!?!?!?! IS YOUR ENVIRONMENT BETTER, SAFER, CLEANER, HEALTHIER.

If it is – you have a great new Environmental Improvement Invention …so keep inventing!!!

**ENVIRONMENTAL IMPROVEMENT INNOVATIONS**
**Ideation – Module #2 – WHATS YOUR PROBLEM?!?!??!**

Now that you've got YOUR idea underway – and are ready to become the Inventor of the world's next great 'Environmental Improvement' - lets see how much you know about some environmental challenges - and what has been invented to improve them already by inventors just like you from all over the country. You see – there are inventors everywhere – so there's no reason the next great inventor shouldn't be YOU!!!

TEST YOUR "ENVIRONMENTAL CHALLENGE "IQ":

1) What is the system installed under cars to help keep the air clean?
    a. Where did you look to learn about it?
    b. Who invented it?
    c. Could you improve it?
    d. How?

2) Name the 'system' designed to enable us to re-use materials and products?
    a. Where did you look to research this system?
    b. Is there more than one?
    c. Who invented it?
    d. Could you improve it?
    e. How?

3) Is there a product/invention/system to make water safer/cleaner?
    a. List at least ten?
    b. Where did you look?
    c. Are they being used?
    d. Where?
    e. Name the inventor(s)?

4) How can our 'auditory' environment be improved?
    a. Name 5 inventions?
    b. What do they do?
    c. How do they work?
    d. Would YOU use them?
    e. Name their inventor(s)?

RESEARCH ACTIVITY:
List FIVE companies, organizations or individual inventors who lead the country in Environmental Awareness and Innovation.

| LEADERS (Co, Org., Ind.) | INVENTION/INNOVATION (What they did) | I FOUND THEM HERE (website/book) |
|---|---|---|
| 1) | | |
| 2) | | |
| 3) | | |
| 4) | | |
| 5) | | |

# social entrepreneurship

## Did you know?

**There are 2.2 billion children in the world. 1 billion of them live in poverty**

***Over 25,000 children die every day around the world***
*due to poverty, hunger, easily preventable diseases, & other related causes.*

"Social entrepreneurs identify resources where people only see problems. They view the villagers as the solution, not the passive beneficiary. They begin with the assumption of competence and unleash resources in the communities they're serving."
David Bornstein | *How to Change the World: Social Entrepreneurs and the Power of New Ideas*

"**Entrepreneurs** assemble resources including innovations, finance, and business acumen in an effort to transform innovations into economic goods." *Wikipedia*

"**Social Entrepreneurs** assemble resources including innovations, finance, and business acumen in an effort to transform society." *Lukepedia*

### Global social enterprises

Kiva - microfinance | www.kiva.org
Muhammad Yunus (Grameen Bank) | www.grameen-info.org
d.ight design – affordable solar lantern | www.dlightdesign.com
Acumen Fund - social venture capital | www.acumenfund.org
Ashoka - global network of social entrepreneurs | www.ashoka.org

### Ohio social enterprises

FreshBox Catering | www.freshboxcatering.com
The Nicholson Center | www.thenicholsoncenter.com

## What will you do?

# The Elevator Pitch

An elevator pitch is your opportunity to share an idea, company, project, dream or opportunity with an investor who has limited time to hear about what you are working on. You must hit several key points in the time you have available and you must customize your pitch to suit the audience.

The term arose because at any time you might find yourself in an elevator with an influential person. You have their undivided attention for sixty seconds while they ride to their floor. If you ever find yourself in an elevator with Donald Trump, Warren Buffet, or Rich Langdale you should be prepared to share your story and capture a meeting with the influential person.

**Point**: The purpose of an elevator pitch is to obtain a second meeting. Your goal is to convince the audience that you understand your industry and have a valuable opportunity which the investor should be interested in.

**What your "Elevator Pitch" must contain:**

1. *A "hook"*
   Open your pitch by getting the Investor's attention with a "hook." A statement or question that piques their interest to want to hear more.

2. *About 150-225 words*
   Your pitch should go no longer than 60 seconds.

3. *Passion*
   Investors expect energy and dedication from entrepreneurs.

4. *A request*
   At the end of your pitch, you must ask for something. Do you want their business card, to schedule a full presentation, to ask for a referral?

**I want to see a real one:** Go online to www.youtube.com and search for elevator pitches and you will see some good and bad examples of elevator pitches.

**The ones I avoid:** Submissions into elevator pitch competitions are all over the internet and I recommend avoid people who are speed talking because I don't think that is a good reflection of an actual elevator pitch delivery. It is important to talk fast in an elevator pitch because of limited time but remember you are developing a relationship with the influential person not just barking a prepared speech at them.

-Prepared by Robert J Nicholson: rjncarpediem@gmail.com

**Six questions your "Elevator Pitch" must answer:**

1. *What is your product or service?*
   Briefly describe what it is you sell. Do not go into excruciating detail.

2. *Who is your market?*
   Briefly discuss who you are selling the product or service to. What industry is it? How large of a market do they represent?

3. *What is your revenue model?*
   More simply, how do you expect to make money?

4. *Who is behind the company?*
   "Bet on the jockey, not the horse" is a familiar saying among Investors. Tell them a little about you and your team's background and achievements. If you have a strong advisory board, tell them who they are and what they have accomplished.

5. *Who is your competition?*
   Don't have any? Think again. Briefly discuss who they are and what they have accomplished. Successful competition is an advantage-they are proof your business model and/or concept work.

1. *What is your competitive advantage?*
   Simply being in an industry with successful competitors is not enough. You need to effectively communicate how your company is different and why you have an advantage over the competition. A better distribution channel? Key partners? Proprietary technology?

# WHAT DO YOU KNOW????

## QUIZZES:

1) What do these inventors have in common?
First Washing Machine (1871)
First Dishwasher (1872)
First Car Heater (1893)
First Medical Syringe (1899)
First Windshield Wipers (1903)

2) In 1890 – what percent of patents were issued to women?

3) By 2002 – what percent?

4) When was the 1st woman inducted into the National Inventors Hall of Fame?
For What?
Who was her colleague?
How many patents did she have?
What other honor does she hold?

5) Who invented and patented a diver's suit in 1921, and was claustrophobic?

6) Is this a real quote – and who said it?
"Everything that can be invented – has already been invented."

7) What did Albert Nobel – the man who invented the five nobel prizes, invent?
Cotton Candy, Bulletproof Vest, Submarine, Compass,
Dynamite?

8) What did Rube Goldberg 'invent'?

9) Which American President was the most prolific inventor – with 9?
Lincoln, Jefferson, Roosevelt, Nixon.

## PATENT QUIZZES:

10) Who did the 1st patent issued in the United States go to & how much did it cost?

11) How much does a patent cost average today?

12) The first patent issued in the world was issued to whom, where, and when?

13) Who invented three of the biggest 'failures' that resulted in billion dollar industries?

14) What were their 'failures'…?

15) Is the World Wide Web patented?

ANSWERS

1): All Women inventors
2): Fewer than one percent.
3): 15%
4): 1991; Drugs to fight leukemia, malaria, gout and AIDS; George Hitchings; 45 patents; Nobel Peace Prize.
5): Harry Houdini.
6): Yes; Former patent commissioner Charles Duell; in 1899.
7): Dynamite.
8): Though famous for his 10-step cartoons depicting how to perform a simple task – Mr Goldberg did not 'invent' anything.
9): Jefferson.
10): Samuel Hopkins; it cost $4.
11): $4,000.
12): Filippo Brunelleschi, Italy, 1421.
13): a) Chester Carlson, b) Charles Darrow and c) Caleb Bradham.
14): a) The Model 914 Haloid; a photocopying device; later known as a Xerox;
b) The Landlord's game – now known as "Monopoly";
c) Brad's drink (named after himself) which would later become 'Pepsi'.
15): No. Tim Bernes-Lee – could have – but chose not to.

# WHAT DOES IT ALL MEAN? GLOSSARY

Words are powerful – and have many meanings given the different contexts in which they may be used. Some VERY FAMILIAR terms to you – like 'Assignment' – may have a VERY DIFFERENT meaning – when used in the world of inventing.

Like inventions….words also have different levels of sophistication. Distinctly different words can carry the same meaning….they are simply chosen to better suit the reader or speaker…and his/her age…or the circumstances in which they are to be used; in this case- the age/understanding level of the inventor. (Adult inventors may use more sophisticated language…but we've proven time and time again that young people often have the biggest ideas!!!)

So – here are a few examples of words inventors may use - that are very different – but have the same impact ….deliver the same message.

**GLOSSARY:**

**Assignment:** 1) Homework; 2) Transfer of Ownership of Intellectual Property; 3) A minty poster/sign/placard.

**Burden of Proof:** 1) What you must produce – to back up your 'the dog ate my homework' story, 2) The obligation to establish a connection as fact by evoking evidence of a probable truth.; 3) Heavy senior pictures.

**Claims:** 1) What you tell your teacher about why your homework is late; 2) The part of a patent wherein the invention and the aspects of the invention that are legally enforceable are defined. Or 3) where you find your bag at the airport.

**Critical Date:** 1) The big homecoming dance; 2) The date by which an application must be filed to avoid losing rights in the invention. 3) When you are finally able to legally drive.

**Distribution Channels:** 1) Twitter, facebook, texting; 2) How you get your product from manufacturer, to the end user; retail/web/ catalogs/TV/wholesale/Brokers and distributors; 3) Cable, Satellite, Smoke Signals

**Inventor's Notebook:** 1) Your journal or diary, 2) A history of your invention from start to finish; a collection of sequentially numbered and bound pages (that prevents someone from adding or removing pages) in which to record invention notes. All notes should be signed by a witness (who will not benefit financially from the invention), which can establish the first date of invention; 3) A REQUIREMENT of the Invention Convention:

**Non-obvious:** 1) Being the last person anyone would ever think was an inventor; 2) A criterion in Section 103 of the U.S. Code patent statutes which requires that an invention cannot receive a valid patent if the invention could not readily deduced from publicly available information by a person of ordinary skill in the art; 3) The art of standing very still – and hoping no one will notice you.

**Prototype:** 1) A model or small scale replica of your invention idea; 2) A professional typist – registered in the Guinness Book of World Records; 3) A physical representation of an idea that allows an individual to observe and interact with it – A REQUIREMENT of the Invention Convention.

**Reverse Engineering:** 1) Backing up without mirrors; 2) Analysis in order to learn details of design, construction, and operation, perhaps to produce a copy or improved version; 3) Taking something apart to learn how it may have been put together.

**Trade Dress:** 1) More complete version of a trademark; 2) The distinctive packaging or design of a product that promotes the product and distinguishes it from other products in the marketplace; 3) Swapping clothes.

**Trademark:** 1) A directive shouted out on the floor of the New York Stock Exchange – when trading securities of 1,000 shares or more; 2) Any name, symbol, figure, letter, word, or mark adopted and used by a manufacturer or merchant in order to distinguish his or her goods from those manufactured or sold by others. A trademark is a proprietary term usually registered with the Patent and Trademark Office to assure exclusive use by the owner; 3) how you signify what you are wishing to swap.

**Value Proposition:** 1) Meal Deals; 2) The amount paid for a product or service and what a customer receives for that value; 3) What you are willing to pay your little brother or sister to eat your dinner.

**U.S.P.T.O.:** 1) Unbelievable Stacks of Presents To Open; 2) United States Patent and Trademark Office; The Governmental agency charged with determining the patentability of all United States applications; issuing all U.S. patents and trademarks, maintaining the governments patent database, and acting as a receiving office for some international applications; 3) UNMATCHED STUDENT POTENTIAL - THINK OHIO!!.

**ALL ANSWERS are #2.**

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# APPENDIX A: PATENTS IN BRIEF

**APPENDIX A**

**PATENTS IN BRIEF**

A patent is a grant issued by the U.S. Government giving an inventor the right to exclude all others from making, using, or selling his invention within the United States, its territories and possessions.

There are three kinds of patents: 1) Utility patents, granted to the inventor or discoverer of any new and useful process, machine, manufacture, composition of matter, or any new and useful improvement thereof; (2) plant patents, granted on any distinct and new variety of asexually reproduced plant; and (3) design patents, granted on any new, original, and ornamental design for an article of manufacture.

Utility and plant patents are effective for 17 years from the date issued, subject to the payment of maintenance fees; design patents are effective for 14 years. Patents may be extended only by special act of Congress, except for some pharmaceutical patents whose terms may be extended to make up for time lost due to Government required testing.

The basic fee for filing an application for patent ranges from $75 to $370, dependent upon the type of patent application being filed and whether or not the applicant is entitled to status as a small entity (independent inventor, small business concern or non-profit organization). Issue fees range from $110 to $620. Maintenance fees are due at 3 1/2, 7 1/2, and 11 1/2 years from the date the patent is granted.

Applications are assigned to examiners who are experts in various fields of technology. They research previous patents and technical literature to determine whether a. patent should be granted. This procedure normally takes about 18 months.

If you plan to file an application, you or your representative should make a search of patents previously granted to make sure that your idea has not already been patented.

You may do this at the Public Search Room of the Patent and Trademark Office, Crystal Plaza Building No. 3, 2021 Jefferson Davis Highway, Arlington, Virginia. Hours are 8 AM to 8 PM, Monday through Friday except holidays. More limited searches may be made at Patent Depository Libraries located throughout the country.

# APPENDIX A: PATENTS IN BRIEF

The Patent and Trademark Office strongly advises you to consult a patent attorney before attempting to file an application. Names of patent attorneys and agents may be obtained from the classified telephone directories in major cities, or from a directory published by the Government Printing Office.

## DISCLOSURE DOCUMENT PROGRAM

Under its Disclosure Document Program, the Patent and Trademark Office accepts and preserves for a two-year period papers disclosing an invention pending the filing of an application for patent. This disclosure is accepted as evidence of the dates of conception of the invention, but provides no patent protection nor should it be considered a "grace period" during which the inventor can wait to file a patent application without possible loss of benefits. A fee of $6 is charged for this service.

For more information, the book *General Information Concerning Patents*, is available for $2.00 from the Superintendent of Documents, Government Printing Office, Washington, DC 20402 (doc. #003-004-00626-9)

For specific questions, write to the Public Service Center, Patent and Trademark Office, Washington, DC 20231, or call (703) 557-HELP.

# APPENDIX B: TRADEMARKS IN BRIEF

**APPENDIX B**

**TRADEMARKS IN BRIEF**

A trademark (or brand name or logo) is a word, name, symbol, design, combination of word and design or slogan used by a manufacturer or merchant to identify its goods or services and distinguish them from those manufactured or sold by others. When it is used for services, it can be called a service mark.

Trademark rights come from using the mark, and marks are protected under common law from the time they are first used. While there is no requirement to do so, owners of marks who have used them or have a bona fide intention to use them in federally regulated commerce may register them with the Patent and Trademark Office. This provides the owners with certain procedural and legal advantages. For "intent-to-use" applications, actual use of the mark in commerce is a prerequisite to the ultimate issuance of a registration.

Many trademark owners use a TM or SM symbol with their mark to indicate that they are claiming rights in it. The ® symbol may only be used if the Patent and Trademark Office issues a Federal registration. To register a mark, the owner must file an application consisting of a written statement in which the owner indicates among other things the goods or services in connection with which the mark is used and the date of first use of the mark in commerce; a drawing of the mark; five specimens showing the mark as it is actually used (labels, tags, packaging, etc.); and the required filing fee of $175 per class.

Each application is reviewed by an examining attorney to determine if the mark is eligible for registration and is compared with other marks to determine if it is likely to cause confusion with those already registered. If a proposed mark passes the examination, it is then published in the Official Gazette of the Patent and Trademark Office. Those who believe they will be damaged by registration of the mark then have an opportunity to oppose registration. If no opposition is filed, a registration certificate is issued or a notice of allowance is issued to the applicant in an "intent-to-use" application. Within six months after the issuance of the notice of allowance, the applicant must file specimens evidencing use of the mark in commerce, a fee of $100, and a verified statement that the mark is in use in commerce before a registration certificate is issued. The registration may be renewed every 10 years as long as the registrant is still using the mark.

For further information and an application form, write to the Public Service Center, Patent and Trademark Office, Washington, DC 20231, or call (703) 557-HELP.

# APPENDIX C: COPYRIGHTS

**APPENDIX C**

**COPYRIGHTS**

Copyrights give protection from copying for literary, dramatic, musical and artistic works. Copyrights are registered in the Copyright Office of the Library of Congress, and are not handled by the Patent and Trademark Office. Information concerning copyrights may be obtained from the Library of Congress, Information Section, LM-455 Copyright Office, Washington, DC 20559. Telephone (202) 707-2100.

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***The second thing every inventor needs to know is:***
**Inventors aren't successful because they have all the answers - successful inventors have learned how to keep asking questions.**

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