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## Having Fun with Inventions

Sr. M Lou Cota

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# Having Fun with Inventions

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Grade 6-8 Unit Plan

[Carpet Cleaner](#)

**Subject Matter: Science**

**Category: Inventions**

**Lesson Plan Description:** This unit uses science, language arts and technology to develop new ways to problem solve. Inventors and inventions will be investigated, activities to initiate creative thinking will be applied and students are to develop a new product or process to solve a problem.

**Technology Required:** Word Processing, PowerPoint/Slide Show, Inspiration, Time Lines, software for editing photos, sound and videos. Computer, Digital Camera, Camcorder, Scanner, Projector, Microphone, Electronic Folder in which to save documents. Use the Library of Congress and other websites.

**Grade levels:** 6, 7, and 8.

**Time Frame:** 4-5 weeks

**Curriculum Standards:** Science: 11A3a, 11A3c, 11A3g, 11B3a, 11B3b, 11B3c, 13B3d, 13B3e, 13B3f, Language Arts: 1C3a, 1C3c, 3B3a, 1C3a , 3C3b, 4B3a, 5B3a, 5B3b, 5C3c

**Assessment Tool:** Rubric on journal records, PowerPoint presentation of inventors/inventions electronic portfolio of assigned activities, final invention project and presentation, and informal observations.

**Goals:**

- 1. To keep records and a journal of unit activities
- 2. To study and research a minimum of 6 inventors and 6 inventions.
- 3. To solve problems and perform activities which employ and emphasize creative thinking skills.
- 4. To use ingenuity to develop a new product or new method of doing things.
- 5. To make presentations of the results of the study.
- 6. To evaluate the completed study according to a given rubric .

## Introduction:

Illinois Standards
11B3a, 11B3b, 1C3a,

## Create the Environment:

- **Timeline for Inventors/Inventions (to be developed with the activities from Goal 2).**
- **Display of Common Simple and/or Unique Inventions (to be developed with the activities from Goal 2).**
- **Bulletin Boards Captions:**
  - "Imagine" posters from [www.Apple.com](http://www.Apple.com)
  - "Failure is an opportunity to start again more intelligently". H. Ford
  - "Necessity is the Mother of Invention"
  - "Genius is one percent inspiration and ninety-nine percent perspiration." T. Edison
  - "Invention is a combination of brains and materials. The more brains the less materials you need. Charles F Kettering
  - "I invent nothing. I rediscover. Auguste Rodin
  - "The best way to have a new idea is to have lots of ideas.. Linus Pauling
  - "When you change the way you look at things, the way you look at things changes!"

## Classroom Activities:

- "[Mad Hatter](#)" Identify the name of the Wacky Hat Invention
- "[Making Improvements](#)"
- "[Puzzle](#)"

## Introductory Computer Activities:

- Copyright on the Web. [http://www.cyberbee.com/cb\\_copyright.swf](http://www.cyberbee.com/cb_copyright.swf)  
[http://www.cyberbee.com/cb\\_copyright.swf](http://www.cyberbee.com/cb_copyright.swf)
- **Handout: HOW TO CITE YOUR WORK**
- View the PowerPoint on **From Flight to Fancy**  
<http://lcweb2.loc.gov/learn/features/flight/index.html>  
<http://lcweb2.loc.gov/learn/features/flight/index.html>
  - Note the background of each slide is the same to prevent distractions. The transitions between slides do vary a little.
  - Note the citations on the final slides of the show. The name of the picture and the address of each is given.

<http://lcweb2.loc.gov/learn/features/index.html>

<http://lcweb2.loc.gov/learn/features/index.html>

- From Flight to Fancy\_ Click under the Picture where it says to download the slide show.
  - Then click **OPEN not save**. It will take a little while to download
  - **To go off the slide show and back to American Memory, click on the "Back" button at the top left .**
- **What in the World is That?**  
<http://memory.loc.gov/ammem/ndlpedu/features/science/flash.html>

<http://lcweb2.loc.gov/learn/features/science/game.html>

- Play the game: What in the “World is That?”
- Go to Learn More... when you have completed the game.
- Go to each one and Learn More.
  - Begin saving information and pictures of inventors and inventions.
  - Be sure to include citations for all of the information and/or pictures.
  - Each inventor should be in a separate WP document.
  - These are to be saved in your Research Folder.

Include the following:

- The name and if possible a picture of the inventor
- The names (and if possible a picture of at least one) of their inventions,
- Information about the inventor such as the years of their life,
- The characteristics that they possessed to be able to become an inventor.

**Goal #1 To keep records and a journal of unit activities**

<b>Illinois Standards</b>
1C3a, 3B3a, 5A3a

**Activities:**

- The student will record the progress taken during this unit.
  - When possible this log sheet will be signed by an observer and is part of the final project.
- Pictures/audio and/or video (dated) of various activities will also be included.

- An electronic portfolio will contain various activities assigned such as PowerPoint presentations and Inspiration reports.
  - Folders should include:
    - Research Information
    - Media, media downloads and citations. (Photos of progress)
    - Assignments and a folder for
    - TeacherTalk (Information/Directions provided by the teacher is placed here.)
- Sketching Gadget Anatomy: (practice for sketching individual "inventions".)
  - Classroom Activity  
<http://www.mos.org/sln/Leonardo/SketchGadgetAnatomy.html>
  - Make use of the classroom activity of sketching Gadget Anatomy.

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**Goal #2 To study and research a minimum of 6 inventors and 6 inventions.**

<b>Illinois Standards</b>
1C3a, 1C3b, 1C3c, 3B3a, 3C3b, 4B3a, 5A3a, 5A3b, 5A3c, 5C3c

**Activities:**

- Research the netLibrary ebooks on inventors.  
<http://www.netlibrary.com/> Search - inventors <http://www.loc.gov/rr/scitech/>
  - Save a WP document for each of at least 6 inventors. Each document is to have:
    - (The citations for all of the information and/or pictures.)
    - The name and if possible a picture of the inventor
    - The name (and if possible a picture of at least one) of their inventions, information about the inventor such as the years of their life and the characteristics that they possessed to be able to become an inventor.
  
- Research the netLibrary e-books on inventions.  
<http://www.netlibrary.com/> Search - inventions <http://www.loc.gov/rr/scitech/>
  - Save a WP document for each of at least 6 inventions. Each document is to have:
    - (The citations for all of the information and/or pictures)

- The name and if possible a picture of the invention.
  - The name of the inventor and date of the invention.
  - The use of the invention and how it impacts on society.
- Write a biography of an inventor. Include the inventor's successful and unsuccessful inventions. Describe the motivations of and the obstacles faced by the inventor.
  - Produce a radio or television news segment interviewing a famous inventor. Dress according to the time period.
  - [Use adaptations of Inspiration templates to compare/contrast inventors.](#)
  - <http://www.mos.org/sln/Leonardo/LeosMysteriousMachinery.html> Play the game about Leonardo's Mystery Machinery
  - Make a list of familiar inventions – (E.g. Cars, appliances, tools, games, toys, food, drink, safety pin, tooth paste, mousetrap, and suggest what prompted the invention.)
  - Make a list of products/devices and suggest another use for each of these. E.g.
    - Rain gutter for book display.
    - Combine pencil, string for compass.
    - Put a pencil to name a plant.
    - Ways to memorize.
    - A new card game.
  - What prompted the invention of (a list of familiar inventions – e.g.. (cars, appliances, tools, games, toys, food, drink, safety pin, tooth paste, mousetrap)
  - Imagine: describe the invention from a given invention name list. <http://www.inventnow.org/html/finalists.html>
  - Name it: suggest a name for the given invention. [http://eduplace.com/science/invention/resources/real\\_inventions.html](http://eduplace.com/science/invention/resources/real_inventions.html)
  - Create a class table of inventions that came about from failures of other inventions. E.g., Post-It Notes, which were developed using glue intended for another purpose
  - Communicate with senior citizens to determine what inventions have most influenced their lives. Communication can be made via e-mail or internet with senior citizen groups across the country. Compare findings for various groups of senior citizens.
  - Create a timeline of inventions and inventors. This timeline can be a class project that continues to grow as students do more research. Use creative writing and illustrations.
  - Study old photos to trace the development of invention over time. (Eg. auto, train, airplane) What can you tell about the tools, technology, etc available at the time?
  - Hypothesize about the uses of unusual objects found in old photos.

**Teacher:**

- <http://www.amazing-kids.org/kids3-00.htm#industrious> Read about amazing kids inventions...
- [http://www.noogenesis.com/inventing/pencil/pencil\\_page.html](http://www.noogenesis.com/inventing/pencil/pencil_page.html) Inventing a new kind of a pencil...
- Assign: Make a [PowerPoint](#) / (Slideshow) Presentation of Inventors and Inventions.
  - **Slide 1 – Title page, include your name and date**
  - **Slide 2 - At least one slide for each of 6 inventors. Include name, dates of life, significant information, and picture if possible.**
  - **At least one slide for each of 6 inventions. Include the invention name, significant information (how used, importance to society, etc.) and picture if possible.**
  - **Closing slides are to include the citations for information gathered unless the citations are included with the material on the individual slide pages.**
  - **A final closing slide -**
- Research Web Sites: More LOC Resources...
  - Visit the British and American Invention Exhibit. Note the way the exhibit is able to include documents that are not allowed to be used in this on-line exhibit. <http://www.loc.gov/exhibits/british/brit-5.html>

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**Goal #3 To solve problems and perform activities which employ and emphasize creative thinking skills.**

<b>Illinois Standards</b>
11B, 5C3c

**Activities:**

- Use Inspiration to Brainstorm Topic Ideas: (rapid fire)
  - Uses of a paper clip

- Ways to say hello, goodbye, yes, etc.
- Ways to get to Hawaii
- Reasons to eat healthy foods
- Ways to catch a frog
- How you can reach high places
- Suggest a use for a combination of articles found in a paper bag. (e.g... Empty TP roll, pencils, and 3 paper clips) Write an explanation and draw a picture of the combined articles. Suggest a name, use/uses, cost, etc.
- A different way of looking at something. *Solve a puzzle – Inside/Out Puzzle...* (Make “Puzzles” for each group. --Take a full page picture, cut around the edges so that it is not completely square. (Stiff paper – perhaps from a calendar.) Fold and cut this page in fourths. Now cut each piece into puzzle pieces. Have students put the “puzzle” back together.
- New ways of seeing: optical illusions
  - The Necker Cube
  - 3D illusions: Statue of Liberty, etc.
  - Young/Old Lady
  - Make a PowerPoint flip book to show “motion”

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**Goal #4 To use ingenuity to develop a new product or new method of doing things. –**

<b>Illinois Standards</b>
3B3a, 3C3a, 5C3c, 11A3a, 11A3b, 11a,3c, 11a3d, 11a3e, 11a3f, 11B3a, 11B3b, 11B3c

**Activities:**

**Journal any/all of the following:**

- Make of list of things that bother you or problems that, if solved, would make life easier for you.
- Survey at least 5 others as to things that bug them or problems to be solved.

**Think about or look around school, home, fun things you do,**

- What tasks (chores) could be made easier? Done better?
- What fun activity could be made to be more fun? More challenging?
- What object could work better? Easier? What could be added to it? Subtracted from it?

**Apply ecology ideas: reuse, recycle, reduce??**



### Skills to keep in mind while problem solving..

- Open and curious mind to world around
- Acquire as much information as possible about the idea, problem, or invention before starting
- Continue to use trial/error in the problem solving process.
- Strive to improve the idea or design after the solution
- Be dedicated, persistent and optimistic about the solution
- Keep in Mind...
  - What can I read?
  - Who can I talk to?
  - What material are needed?
  - Control the cost.
  - Keep records of the steps to follow and the time for each step,
  - Give directions on how to test the item.
  - How can one be sure of safety?
  - Check if there already is a patent of the idea.

### Teacher:

- Inventing a New Kind of Pencil (Teacher Led Discussion)
  - [http://www.noogenesis.com/inventing/pencil/pencil\\_page.html](http://www.noogenesis.com/inventing/pencil/pencil_page.html)
  - [http://www.noogenesis.com/inventing/kids/kids\\_page.html](http://www.noogenesis.com/inventing/kids/kids_page.html)
- **Assign: Make an invention:**
  - **An invention can either be a:**
    - device (apparatus, machine e.g. telephone, pencil, TV., skateboard)  
or
    - procedure (method, process, such as the steps to coat a thin sheet of plastic, such as tape, or post-em notes )
  - which has the following two characteristics:
    - New (novel)
    - Useful

Goal #5 To make a presentations of the results of the study

Illinois Standards
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**Activities:**

- **Presentation on Inventors/Inventions.**
- **Presentation on "new" idea or process.**
  - Who is the audience for this invention?
  - What is the cost?
  - How can this be advertised, packaged? "Why does the world 'need' this?"
  - Give a name for this product or process.
  - Identify the safety features and simplicity of construction.
  - Give a Written Report, Poster, Product, PowerPoint or SlideShow
  - Package for the product? Why the world needs this!

**Goal #6 To evaluate the completed study according to a given rubric**

- **Journal Records**
- **PowerPoint Presentations of Inventors/Inventions**
- **Electronic Portfolio of Assigned Activities**
- **Final Invention Project and Presentation.**
- **Informal Observations**

<b>Illinois State Standards for this Unit</b>	
<b>State Goal 1: Read with understanding and fluency.</b>	
State Standard C. Standard: Comprehend a broad range of reading materials.	
1C3a Use information to form, explain and support questions and predictions.	
1C3c Compare, contrast and evaluate ideas and information from various sources and genres.	
<b>State Goal 3: Write to communicate for a variety of purposes.</b>	
State Standard B. Compose well-organized and coherent writing for specific purposes and audiences.	
3B3a Produce documents that convey a clear understanding and interpretation of ideas and information and display focus, organization, elaboration and coherence.	
3C3a Compose narrative, informative, and persuasive writings for a specified audience.	
3C3b Using available technology, produce compositions and multimedia works for specified audiences.	
<b>State Goal 4: State Goal 4: Listen and speak effectively in a variety of situations.</b>	
State Standard B Speak effectively using language appropriate to the situation and audience.	

<b>4B3a Deliver planned oral presentations, using language and vocabulary appropriate to the purpose, message and audience; provide details and supporting information that clarify main ideas; and use visual aids and contemporary technology as support.</b>
<b>State Goal 5: Use the language arts to acquire assess and communicate information.</b>
<p style="text-align: center;"><b>State Standard A Locate, organize, and use information from various sources to answer questions, solve problems and communicate ideas.</b></p> <p style="text-align: center;"><b>5A3a Identify appropriate resources to solve problems and answer questions through research.</b></p> <p style="text-align: center;"><b>State Standard B Analyze and evaluate information acquired from various sources</b></p> <p style="text-align: center;"><b>5B3b Identify, evaluate and cite primary resources.</b></p>
<b>State Goal 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.</b>
<p style="text-align: center;"><b>State Standard A Know and apply the concepts, principles and processes of scientific Inquiry.</b></p> <p style="text-align: center;"><b>11A3a Formulate hypotheses that can be tested by collecting data.</b></p> <p style="text-align: center;"><b>11A3c Collect and record data accurately using consistent measuring and recording techniques and media.</b></p> <p style="text-align: center;"><b>11A3g Report and display the process and results of a scientific investigation.</b></p>
<p style="text-align: center;"><b>State Standard B Know and apply the concepts, principles and processes of technological design.</b></p> <p style="text-align: center;"><b>11B3a Identify an actual design problem and establish criteria for determining the success of a solution.</b></p> <p style="text-align: center;"><b>11B3b Sketch, propose and compare design solutions to the problem considering available materials, tools, cost effectiveness and safety.</b></p> <p style="text-align: center;"><b>11B3c Select the most appropriate design and build a prototype or simulation</b></p> <p style="text-align: center;"><b>11B3d Test the prototype using available materials, instruments and technology and record the data.</b></p> <p style="text-align: center;"><b>11B3e Evaluate the test results based on established criteria, note sources of error and recommend improvements.</b></p> <p style="text-align: center;"><b>11B3f Using available technology, report the relative success of the design based on the test results and criteria.</b></p>
<b>National Educational Technology Standards for Students</b>
<p style="text-align: center;">1. Basic operations and concepts</p> <p style="text-align: center;">Students demonstrate a sound understanding of the nature and operation of technology systems.</p> <p style="text-align: center;">Students are proficient in the use of technology.</p>
<p style="text-align: center;">5. Technology research tools</p> <p style="text-align: center;">Student use technology to locate, evaluate, and collect information from a variety of sources.</p> <p style="text-align: center;">Students use technology tools to process data and report results.</p> <p style="text-align: center;">Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.</p>

### The Kirkland Back Scratcher

Purpose: The Kirkland Back Scratcher is used to scratch those places you can't reach.

Description: The Kirkland Back Scratcher has

A. A scratcher utensil and

B. Furry's for when you scratch too hard.

Price: The price range is around \$5 to \$9 depending on the size.

Focus on the center crossbar. What happens?

Optical Illusions.... Young woman/ Old woman???

Stereograms, 3-D pictures based on the work of Dr. Bela Julesz called random-dot drawing. At first glance there does not appear to be an image present, just a bundle of dots. Give your mind a change and, amazingly, a pattern emerges from the dots.

(Magic Eye II 3D Illusions by N.E. Thing Enterprises, Scholastic Inc. N.Y. 1994)

### Survey Form

“Work out” objects – plan for long plane – car rides.

What is my biggest problem, what bugs me?

What activity could be made easier?

What object could work better (Can opener)

What things that I like to do could be made more fun? (read – bk mark, light.. pillow)

What things around me could work better

What product easier to use – casup

What can add to make better

What can I take away to work better

What are some new uses for the object? (Ecology, Reuse, Reduce, Recycle)

What parts could be rearranged to work better or new product.

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