



Chapter 4 ~ Science and Mathematics

*“... The most valuable of all arts
will be the art of deriving a
comfortable living from the land
and agriculture...”*

Chapter 4 ~ Science and Math

Science – “...The most valuable of all arts will be the art of deriving a comfortable living from the land and agriculture...” Develop lessons in life science that can be integrated into the time period and can focus on biological aspects of prairie development, nutrition, and health. Past agricultural practices can be developed to assist students in making the connection of the growth from an agricultural nation to the present.



<http://www.housemouse.net/tt1860.htm>

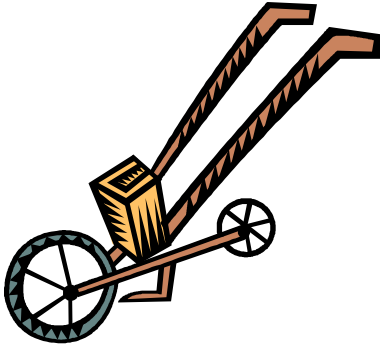
1850s SCIENCE & TECHNOLOGY.

- | | |
|--|--|
| □ Baby carriage: 1850 | □ Bunsen's gas burner: 1850 |
| □ Law of electromagnetic induction: 1851 | □ Continuous stitch sewing machine: 1851 |
| □ Double-decker bus: 1851 | □ Sparrows imported: 1852 |
| □ Plaster bandages: 1852 | □ Tungsten steel: 1855 |
| □ Printing telegraph: 1855 | □ Rayon: 1855 |
| □ Aniline dye: 1856 | □ Cocaine: 1856 |
| □ Steamroller: 1859 | □ Drilled oil well: 1859 |

1860s SCIENCE & TECHNOLOGY.

- | | |
|------------------------------------|------------------------------------|
| □ Linoleum (cork): 1860 | □ Typewriters: 1860 |
| □ Internal combustion engine: 1860 | □ Horse-drawn trams: 1860 |
| □ Antiseptic surgery | □ Speed of light measured: 1862 |
| □ Paper dress patterns: 1863 | □ Heredity: 1865 |
| □ Carpet sweepers: 1865 | □ Railroad sleeping cars: 1865 |
| □ MIT founded: 1865 | □ Bicycle manufacturing: 1867 |
| □ Underground railroad (London) | □ Benzene rings: 1865 |
| □ Atlantic cable connected: 1865 | □ Livingston explores Africa: 1867 |
| □ Postcards: 1869 | □ Periodic law table: 1869 |

Science Fair Projects – 1850s http://www.all-science-fair-projects.com/science_fair_projects_encyclopedia/1850s



Inventions

An **invention** is a novel device or technique.

One question that society often asks is, "What conditions lead to the development of an invention?" There are two main opposing viewpoints on this; one school of thought argues that a lack of resources leads people to invent, whereas, the other school of thought

argues that only an excess of resources will result in inventions.

Castles in the air (or *castles in Spain*) are creative ideas, which cannot be created due to more earthly considerations. The history of invention is full of such castles, as inventions aren't necessarily invented in the order that is most useful. For example, the design of the parachute was worked out before the invention of powered flight. Other inventions simply solve problems for which there is no economic incentive to provide a solution.

Following the terminology of political economist Joseph Schumpeter, an invention differs from an innovation. While an invention is merely theoretical (even though it might have been filed with the Patent Office), an innovation is an invention that has been put into practice.

Timeline of invention From Wikipedia, the free encyclopedia.
http://www.inventions.unitedtradeways.com/#19th_century

18th Century Inventions which would impact the 19th Century

- 1791: Steamboat: John Fitch
- 1790: Cut and head nail machine: Jacob Perkins
 - 1793: Cotton gin: Eli Whitney
- 1793: Moldboard plow: Thomas Jefferson
- 1793: Optical telegraph: Claude Chappe
- 1797: Cast iron plow: Charles Newbold
 - 1798: Vaccination: Edward Jenner
- 1799: Seeding machine: Eliakim Spooner

19th century

- 1800: Electric battery: Alessandro Volta
- 1802: Screw propeller steamboat Phoenix: John Stevens
 - 1802: gas stove: Zachdus Andreas Winzler
 - 1805: Submarine Nautilus: Robert Fulton
 - 1805: Refrigerator: Oliver Evans
 - 1807: Steamboat Clermont: Robert Fulton
 - 1808: Band saw: William Newberry
 - 1819: Standard diving dress: Augustus Siebe
 - 1811: Gun- Breechloader: Thornton (?)
- 1814: Steam Locomotive (Blucher): George Stephenson
- 1816: Miner's safety lamp Davy lamp: Humphry Davy
 - 1816: Hand printing press: George Clymer
- 1816: Metronome: Johann Nepomuk Maelzel (reputed)
 - 1817: Kaleidoscope: David Brewster
 - 1819: Breech loading flintlock: John Hall
- 1819: Stethoscope: Rene Theophile Hyacinthe Laennec
 - 1822: Artificial teeth: C.M. Graham
 - 1823: Electromagnet: William Sturgeon
 - 1827: Insulated wire: Joseph Henry
 - 1827: Friction match: John Walker
 - 1826: Photography: Joseph Nicephore Niepce
- 1826: internal combustion engine: Samuel Morey
 - 1831: Multiple coil magnet: Joseph Henry
- 1831: Magnetic acoustic telegraph: Joseph Henry
 - 1831: Reaper: Cyrus McCormick
 - 1834: Electric motor: Thomas Davenport
- 1835: Photogenic Drawing: William Henry Fox Talbot
 - 1835: Revolver: Samuel Colt
 - 1835: Morse code: Samuel Morse
 - 1836: Improved screw propeller: John Ericsson
- 1837: Photography: Louis-Jacques-Mandi Daguerre
 - 1837: Steel plow: John Deere
 - 1838: Electric telegraph: Charles Wheatstone
 - 1839: Vulcanization of rubber: Charles Goodyear
- 1840: Frigate with submarine machinery SS Princeton: John Ericsson
 - 1840: artificial fertilizer: Justus von Liebig
 - 1842: Anesthesia: Crawford Long
 - 1843: Typewriter: Charles Thurber
 - 1844: Telegraph: Samuel Morse
 - 1845: Portland cement: William Aspdin
 - 1845: Double tube tire: Robert Thomson (inventor)
 - 1846: Sewing machine: Elias Howe
 - 1846: Rotary printing press: Richard M. Hoe

- 1849: Safety pin: Walter Hunt
- 1849: Francis turbine: James B. Francis
 - 1852: Airship: Henri Giffard
- 1852: Passenger elevator: Elisha Otis
- 1852: Gyroscope: Lion Foucault
- 1853: Glider: Sir George Cayley
- 1855: Bunsen burner: Robert Bunsen
- 1856: Steel process: Henry Bessemer
- 1858: Undersea telegraph cable: Fredrick Newton Gisborne
 - 1858: Shoe sole sewing machine: Lyman R. Blake
 - 1858: Mason jar: John L. Mason
 - 1859: Oil drill: Edwin L. Drake
 - 1860: Linoleum: Fredrick Walton
- 1860: Repeating rifle: Oliver F. Winchester, Christopher Spencer
 - 1860: Self-propelled torpedo: Ivan Lupis-Vukić
 - 1861: Ironclad USS Monitor: John Ericsson
 - 1861: Furnace for steel: Wilhelm von Siemens
 - 1862: Revolving machine gun: Richard J. Gatling
- 1862: Mechanical submarine: Narcms Monturiol i Estarriol
 - 1863: Player piano: Henri Fourneaux
 - 1864: Sleeping car: George Pullman
- 1865: Compression ice machine: Thaddeus Lowe
 - 1866: Dynamite: Alfred Nobel
- 1867: Practical Typewriter: Christopher L. Sholes
- 1868: Typewriter: Carlos Glidden, James Densmore and Samuel Soule
 - 1868: Air brake: George Westinghouse
 - 1868: Lawn mower: Hills Budding Ferrabee (???)
 - 1868: Oleomargarine: Mege Mouries
 - 1869: Vacuum cleaner: I.W. McGaffers








Activity 4.1 ~ Invention Research

Students will choose one of the inventions in the 19th Century invention list above, follow the link to learn more about the invention and create note cards that ask a

question about the invention and inventor and then write the answer. A three to four paragraph research paper will be completed on the invention and the inventor the student has chosen using correct grammar and punctuation. Source citation will be completed at the end of the short research paper. Examples of short research documents are provided as part of this activity. Links for internet citation may be one of the following:

-  **Online document** Author's name (last name first). Document title. Date of Internet publication. Date of access <URL>.
-  Landsburg, Steven E. "Who Shall Inherit the Earth?" *Slate* 1 May 1997. 1 Oct. 1999 <<http://www.slate.com/Economics/97-05-01/Economics.asp>>.
-  A Personal site citation - Pellegrino, Joseph. Home page. 16 Dec. 1998. 1 Oct. 1999 <<http://www.english.eku.edu/pellegrino/personal.htm>>.

Note: Students will use any other citation source provided by the teacher as a priority over the above information.

Can Opener, 1858

British merchant Peter Durand made a huge stride in food preservation with his 1810 invention of the can. Canned rations provided to soldiers and explorers saved legions from sure starvation. So grateful for its inner contents were the hungry recipients that no one really complained about the sweat and toil often required to simply open the can.

In 1858 Ezra J. Warner of Waterbury, Connecticut, patented the first can opener. An intimidating combination of bayonet and sickle, Warner's invention was nonetheless eagerly adopted by the U.S. military during the Civil War. Household use of the can opener increased when William W. Lyman's more user-friendly model was introduced in 1870. No longer did opening a can of peaches mean risking one's fingers.

Blue Jeans, 1850s

Working as a canvas salesman in San Francisco during the California Gold rush of the 1850s, Levi Strauss made a keen observation. He noticed that pants of prospectors and miners could not withstand the wear and tear of their profession. Strauss decided to stitch some canvas together and sell them as pants. What they lacked in comfort, Strauss's pants made up in durability. When he discovered that using denim -- canvas dyed blue to better conceal stains -- produced even more popular and comfortable apparel, an American fashion mainstay had been established. Once the work wear of cowboys, miners, and ranchers, blue jeans are today worn by people of all walks of life, at work and play.

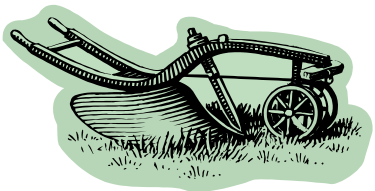
Practice Research for Everyone – The Elevator

<http://www.ideafinder.com/history/inventions/story049.htm>

Find out about the elevator and practice writing something similar to the can opener and blue jean writing you have read above. Make sure you write your questions, then the answers, and document where you found the information.

Sharing Your Research - Think about how your class can share the inventions research you complete so the other grades in your school have a chance to learn something about the past from your class. Talk with your teacher and the librarian about an Inventors or Inventions week in the school library or a bulletin board or create a timeline and add the inventions to the timeline on the wall in the hall outside your classroom.

Activity 4.2 - Inventions



Inventors and Inventions: **Scavenger Hunt**

Invention and Design

<http://www.bergen.org/ECEMS/class/welcome.html>

1. What does the site say an “invention” is? Write your answer as a complete sentence in your own words.

1a. Click on Define the Problem. Read about the five steps of the design process. Is there one step that might be more important than the other? Yes No. If yes, which step?

If no, why are all the steps important?

PBS - American Experience

<http://www.pbs.org/wgbh/amex/telephone/sfeature/index.html>

2. Read about Blue Jeans, 1850s. Why did Levi Strauss “invent” blue jeans?

The Franklin Institute Online - Simple Machines

<http://www.fi.edu/qa97/spotlight3/spotlight3.html>

Inventor's Toolbox - The Elements of Machines

<http://www.mos.org/sln/Leonardo/InventorsToolbox.html>

3. Read about simple machines at the websites listed above. List six simple machines. Choose four and name other ways that you have seen them used.

Invention Playhouse

http://www.inventionatplay.org/playhouse_tinker.html

4. Try the Tinker Ball exploration. Can you build a track that works by tinkering with everyday objects?

"Inventions Patented in the U.S. 1800 - 1860"

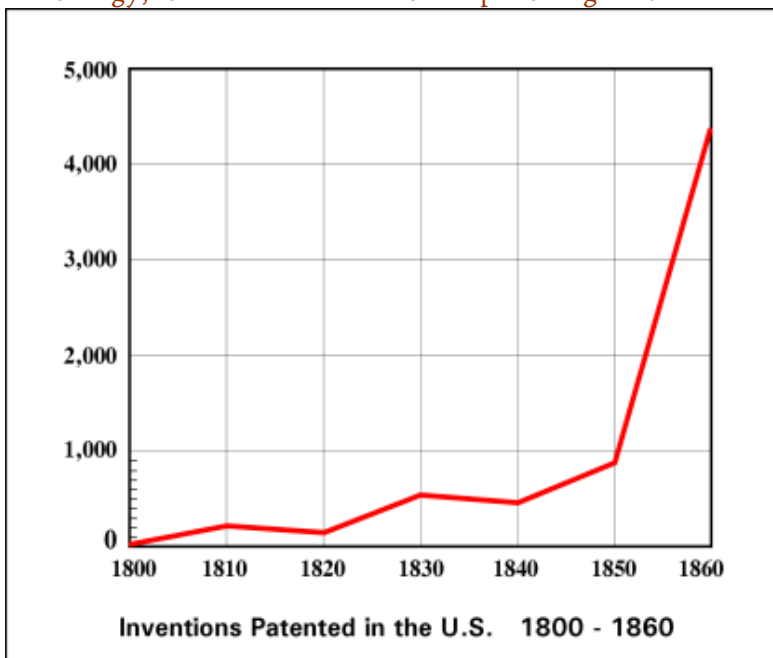
This chart shows that in the early 1800s, a very significant change was underway in the United States. As the Industrial Revolution began, inventors saw the opportunity to profit by developing ideas and applying for patents. There are ups and downs in the early decades due to various factors, but clearly the trend is upward. Around 1850 the number of patents issued is soaring.

An important point to make is that this inventiveness was promoted and supported by the patent system, which protects the inventor's right to profit from his or her invention. Without that protection, few people will spend the countless hours of work and frustration that is usually a big part of the inventor's life.

"What decades seem to be..."

One of the dramatic jumps on the graph is the period from 1820 to 1830. The jump is probably related to the rise of the textile industry in the New England states. This decade is often cited as evidence that the Industrial Revolution had taken hold in America.

Another impressive jump comes in the decades of the 1840s and 1850s. By that time the railroad industry was growing very rapidly, and factories of all kinds were being established. Steam power was replacing water wheels. All of these changes involve new ideas and new technology, and this is reflected in the patent figures.



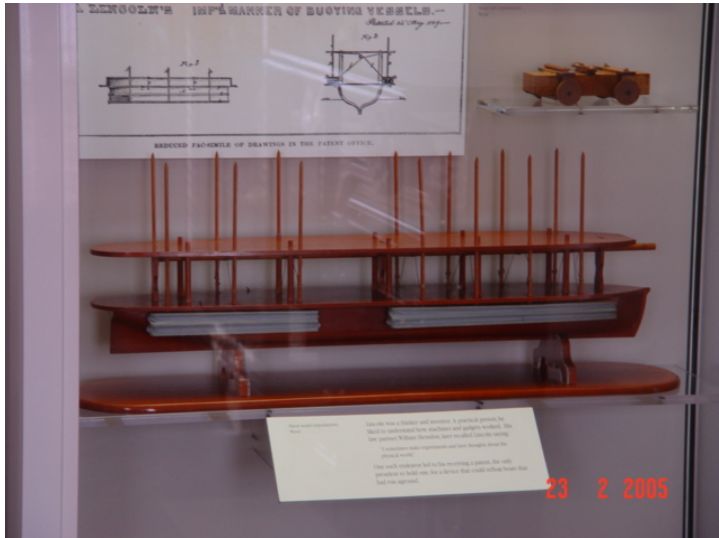
What do you notice between 1850 and 1860?

In small groups of students, discuss the question about the graph and the dramatic changes in the number of inventions patented between 1850 and 1860. Create a list of all the reasons your group thinks might be reasons for this dramatic increase. Share your group lists with each other and create one large whole group class list of all the reasons your groups can think of. Vote on which reasons your class believes make the most sense about the increase and create a chart to show the votes and calculate the percentages. Enjoy.

Teaching with Documents – Eli Whitney and the Cotton Gin
archives.gov/digital_classroom/lessons/cotton_gin_patent/cotton_gin_patent.html

"The Patent System added the fuel of interest to the fire of genius."

—Abraham Lincoln



Lincoln's Patent

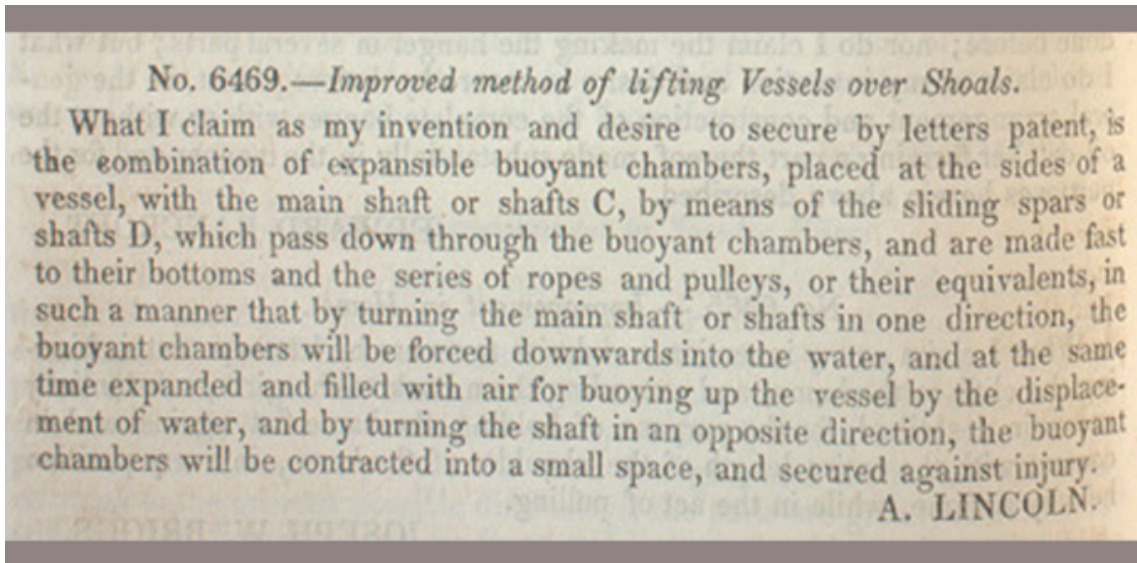
On May 22, 1849, Abraham Lincoln received Patent No. 6469 for a device to lift boats over shoals, an invention which was never manufactured. However, it did make him the only U.S. president to hold a patent. Shown here is his scale model at the Smithsonian Institution in Washington, D.C.

Photo Source: Peggy Dunn. Lincoln Home National Historic Site. 2005



Lincoln's Patent Idea Lincoln started work on his invention between sessions of Congress in 1848. On his way home to Illinois his boat became stranded on a sandbar. As Herndon told the story, "The captain ordered the hands to collect all the loose planks, empty barrels and boxes and force them under the sides of the boat. These empty casks were used to buoy it up. After forcing enough of them under the vessel she lifted gradually and at last swung clear of the opposing sand bar."

To read the full text of the article on Abraham Lincoln's patent at
<http://showcase.netins.net/web/creative/lincoln/education/patent.htm>



Source: <http://digital.library.mcgill.ca/lincoln/exhibit/imgdisplay.php?sec=1&item=8>

Abraham Lincoln ~ Discoveries and Inventions

http://members.tripod.com/~american_almanac/lincoln.htm

Abraham Lincoln had a strong interest in new technology and is the only U.S. President to hold a patent. As a young man, Abraham Lincoln took a boatload of merchandise down the Mississippi River from New Salem to New Orleans. At one point the boat slid onto a dam and was set free only after heroic efforts. In later years, while traveling on the Great Lakes, Lincoln's ship ran a foul of a sandbar. These two similar experiences led him to conceive his invention. Lincoln received Patent #6,469 for "A Device for Buoying Vessels Over Shoals" on May 22, 1849.

The invention consists of a set of bellows attached to the hull of a ship just below the water line. On reaching a shallow place, the bellows are filled with air and the vessel, thus buoyed, is expected to float clear. The invention was never marketed, probably because the extra weight would have increased the probability of running onto sandbars more frequently. Lincoln whittled the model for his patent application with his own hands. It is on display at the Smithsonian Institution National Museum of American History. A replica is on display in the Dean House Museum at the Lincoln Historic Home site in Springfield, Illinois.

In 1858, Abraham Lincoln called the introduction of patent laws one of the three most important developments "in the world's history," along with the discovery of America and the perfection of printing. During the Civil War, he took a personal interest in new weapons, advocating the adoption of ironclad ships, the observation balloon, the breech-loading rifle, and the machine gun. Lincoln declared, "The patent system added the fuel of interest to the fire of genius."

http://inventors.about.com/library/inventors/blkidprimer6_12pres.htm

Activity 4.3 ~ Inventions

Abraham Lincoln- the Inventor

Name _____

Develop a hypothesis about why you believe Abraham Lincoln did not build his invention and use it after the work he put into the development of this, patenting his invention, and then never building and selling it.

My hypothesis is

I believe I can prove my hypothesis with the following information

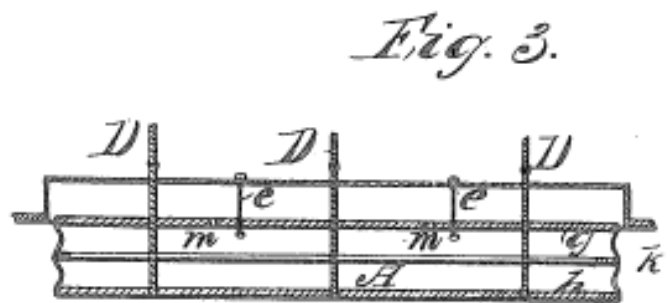
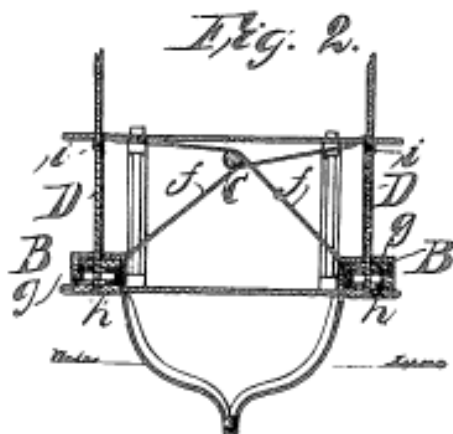
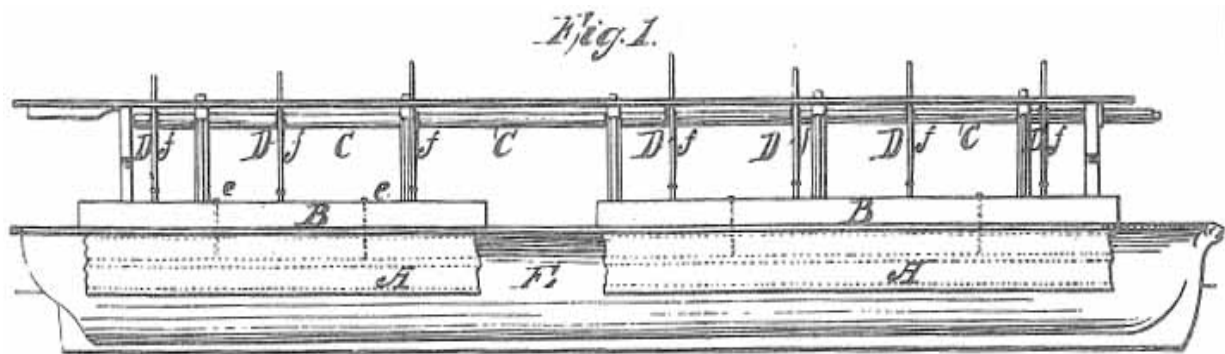


UNITED STATES PATENT OFFICE

ABRAHAM LINCOLN, OF SPRINGFIELD, ILLINOIS.

BUOYING VESSELS OVER SHOALS.

Specification forming part of Letters Patent No. 6,469, dated May 22, 1849; application filed March 10, 1849.



To all whom it may concern:

Be it known that I, Abraham Lincoln, of Springfield, in the County of Sangamon, in the State of Illinois, have invented a new and improved manner of combining adjustable buoyant air chambers with a steamboat or other vessel for the purpose of enabling their draught of water to be readily lessened to enable them to pass over bars, or through shallow water, without discharging their cargoes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification. Similar letters indicate like parts in all the figures.

The buoyant chambers A, A, which I employ, are constructed in such a manner that they can be expanded so as to hold a large volume of air when required for use, and can be contracted, into a very small space and safely secured as soon as their services can be dispensed with.

Fig. 1, is a side elevation of a vessel with the buoyant chambers combined therewith, expanded;

Fig. 2, is a transverse section of the same with the buoyant chambers contracted.

Fig. 3, is a longitudinal vertical section through the centre of one of the buoyant chambers, and the box B, for receiving it when contracted, which is secured to the lower guard of the vessel.

The top *g*, and bottom *h*, of each buoyant chamber, is composed of plank or metal, of suitable strength and stiffness, and the flexible sides and ends of the chambers, are composed of india-rubber cloth, or other suitable water-proof fabric, securely united to the edges and ends of the top and bottom of the chambers.

The sides of the chambers may be stayed and supported centrally by a frame *k*, as shown in Fig. 3, or as many stays may be combined with them as may be necessary to give them the requisite fullness and strength when expanded.

The buoyant chambers are suspended and operated as follows: A suitable number of

vertical shafts or spars D, D, are combined with each of the chambers, as represented in Figs. 2 and 3, to wit: The shafts work freely in apertures formed in the upper sides of the chambers, and their lower ends are permanently secured to the under sides of the chambers: The vertical shafts or spars (D, D,) pass up through the top of the boxes B, B, on the lower guards of the vessel, and then through its upper guards, or some other suitable support, to keep them in a vertical position.

The vertical shafts (D, D,) are connected to the main shaft C, which passes longitudinally through the centre of the vessel—just below its upper deck—by endless ropes *f, f*, as represented in Fig. 2: The said ropes, *f, f*, being wound several times around the main shaft C, then passing outwards over sheaves or rollers attached to the upper deck or guards of the vessel, from which they descend along the inner sides of the vertical shafts or spars D, D, to sheaves or rollers connected to the boxes B, B, and thence rise to the main shaft (C,) again.

The ropes *f, f*, are connected to the vertical shafts at *i, i*, as shown in Figs. 1 and 2. It will therefore be perceived, that by turning the main shaft C, in one direction, the buoyant chambers will be expanded into the position shown in Fig. 1; and by turning the shaft in an opposite direction, the chambers will be contracted into the position shown in Fig. 2.

In Fig. 3, *e, e*, are check ropes, made fast to the tops of the boxes B, B, and to the upper sides of the buoyant chambers; which ropes catch and retain the upper sides of the chambers when their lower sides are forced down, and cause the chambers to be expanded to their full capacity. By varying the length of the check ropes, the depth of immersion of the buoyant chambers can be governed. A suitable number of openings *m, m*, are formed in the upper sides of the buoyant chambers, for the admission and emission of air when the chambers are expanded and contracted.

The ropes *f, f*, that connect the main shaft C, with the shafts or spars D, D, (rising from

the buoyant chambers,) may be passed from one to the other in any direction that may be deemed best, and that will least incommode the deck of the vessel; or other mechanical means may be employed as the medium of communication between the main shaft and the buoyant chambers, if it should be found expedient.

I shall generally make the main shaft C, in as many parts as there are corresponding pairs of buoyant chambers, so that by coupling the sections of the shaft together, the whole of the chambers can be expanded at the same time, and by disconnecting them, either pair of chambers can be expanded, separately from the others as circumstances may require.

The buoyant chambers may be operated by the power of the steam engine applied to the main shaft C, in any convenient manner, or by man power.

Where the guards of a vessel are very high above the water, the boxes B, B, for the reception of the buoyant chambers when contracted, may be dispensed with, and the chambers be contracted by drawing them against the under side of the guards. Or, protecting cases may be secured to the under sides of the guards for the reception of the buoyant chambers when contracted.

When it is desired to combine my expansible buoyant chambers with vessels which have no projecting guards; shelves or cases must be strongly secured to their sides for the reception of the buoyant chambers.

I wish it to be distinctly understood, that I do not intend to limit myself to any particular mechanical arrangement, in combining expansible buoyant chambers with a vessel, but shall vary the same as I may deem expedient, whilst I attain the same end by substantially the same means.

What I claim as my invention and desire to secure by letters patent, is the combination of expansible buoyant chambers placed at the sides of a vessel, with the main shaft or shafts C, by means of the sliding spars or shafts D, which pass down through the buoyant chambers and are made fast to their bottoms, and the series of ropes and pullies, or their equivalents, in such a manner that by turning the main shaft or shafts in one direction, the buoyant chambers will be forced downwards into the water and at the same time expanded and filled with air for buoying up the vessel by the displacement of water; and by turning the shaft in an opposite direction, the buoyant chambers will be contracted into a small space and secured against injury.

A. LINCOLN.

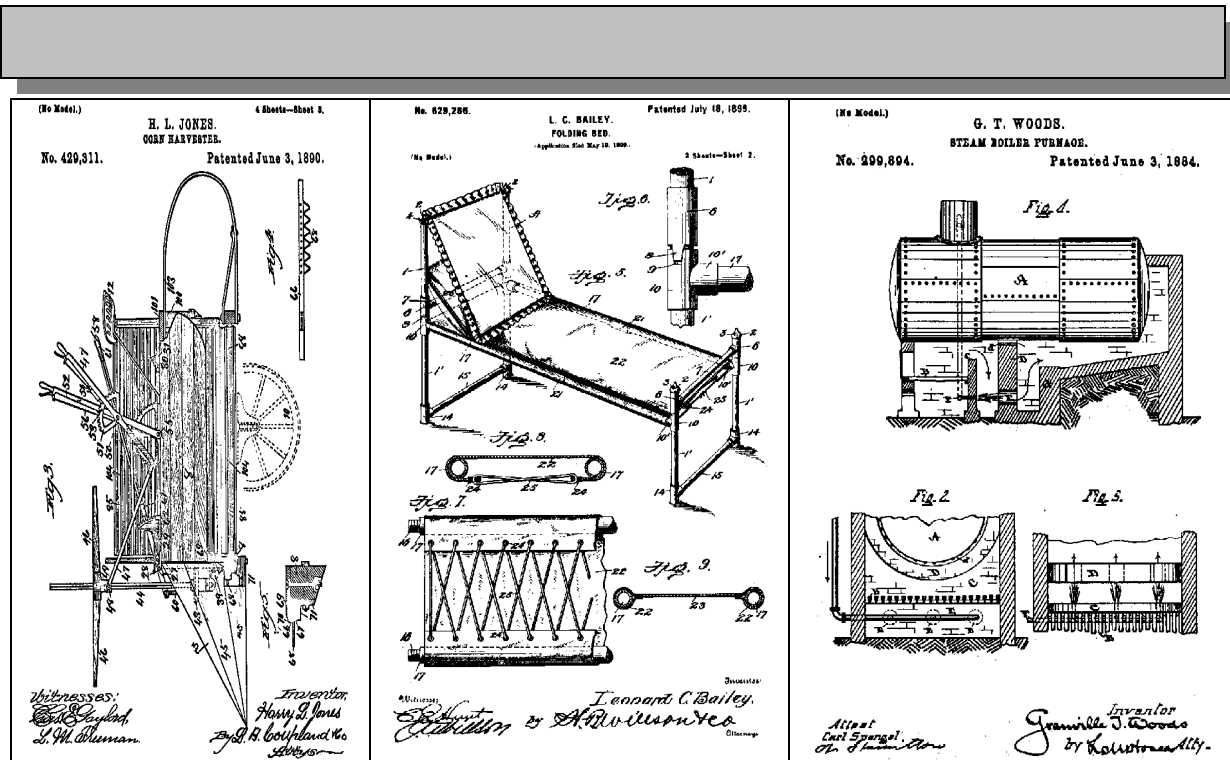
Witness:

Z. C. ROBBINS,
H. H. SYLVESTER.

Activity 4.4 ~ Inventions ~ Guess What I AM??

Name _____

In your small group, look at each picture and try to guess what it might have been used for and write your guesses on the line next to the picture. Share your guesses with the whole class when you are finished. Your teacher will share the answers when you have completed the activity.



1.

2.

3.

We think the objects in the pictures above are (fill in the blank after group discussion, quietly)

Then for each invention, tell what you think it was made to do:

1. _____

2. _____

3. _____

Activity 4.5 ~ Inventions ~ The New Inventors Worksheet

Instructions: In a small group, students will brainstorm ideas for a new invention. They should think about what it might look like as they will be drawing their invention, discussing in writing what it will do, and how it will change an aspect of their own daily lives.

Invention Group Name: _____

Group Members: _____

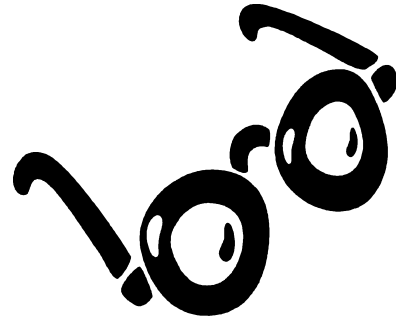
Invention: _____

Draw a picture of your group's invention here:



Our invention will do the following and then it will change our daily lives by:

For Teacher's Eyes Only



Answer Key for Inventions Activity –
What is It?

1. H. L Jones Corn Harvester - June 1839
2. L. C. Baileys folding Bed - July 10, 1869
3. G. T. Woods Steam Boiler Furnace - June 3, 1884

More Inventor Resources:

Zoom Inventors and Inventions

<http://www.enchantedlearning.com/inventors>

From Mind to Matter – 20th Century Inventions

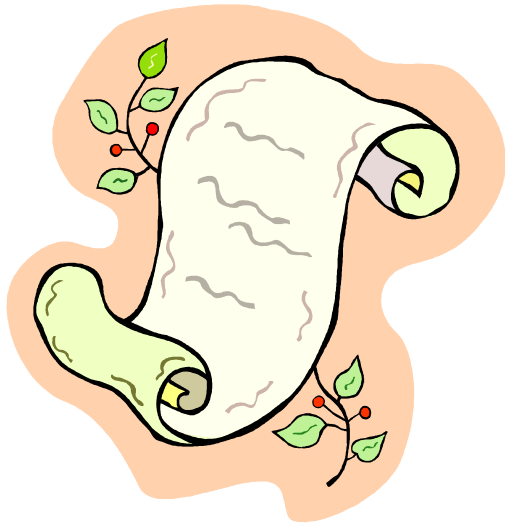
<http://library.thinkquest.org/21798/data/tqmainsite/timeline/banner.html>

Clever Contraptions: Designing and ‘Patenting’ Original Inventions
Lesson Plan

http://www.nytimes.com/learning/teachers/lessons/19990909thursday.html?searchpv=learning_lessons

The Lemelson Center for the Study of Invention & Innovation

<http://invention.smithsonian.org/resources>



Activity 4.6 ~ Invention

Name: _____

Lincoln Patent Office Document

Invention Activity ____

Written Document Analysis Worksheet

Adapted from U.S. National Archives
and Records Administration

www.archives.gov

Instructions: After reading the document listed for this activity, place your worksheet next to the document and work to find the answers. Highlight or underline the answers in your copy of the document before you begin to write the answers in your written document analysis worksheet. The questions are directly related to your document.

1. What is this document called?
2. Where was it issued?
3. What is the issuing agency?
4. Why do you think it was issued?
5. To whom was it issued?
6. Does this document list more than one person? What is the relationship between the people if there is more than one?
7. When was it issued? Could this document be used more than one time? What is the evidence that supports your answer?

8. List three pieces of information from the document that can help you write a description that explains how this document would be used.

a.

b.

c.

9. List two pieces of information from the document that will help you describe and explain what the pictures are in this document.

10. What are some questions that you would like to ask the inventor to help you better understand the document.

11. What does the existence of this document say about the society that created it? Do you believe these documents are still used today? For what purpose?



Memo from the President of the United States

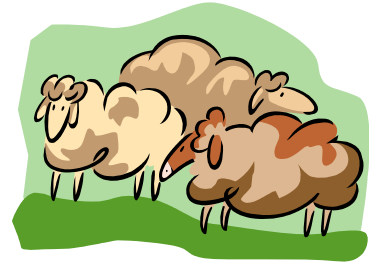
To: Black Hawk War Veterans

From: Andrew Jackson,

The President of the United States

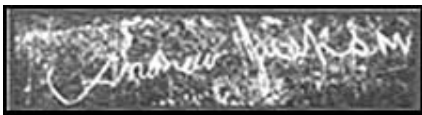
Date: 12/1/1834

Re: Land Script



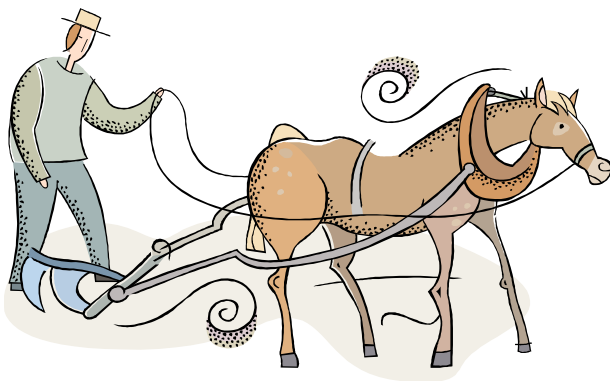
The United States Government intends to provide to the veterans of the Black Hawk War in Illinois are now eligible for a double land script if groups of veterans can come to work together to create a community plan. An offer of 1,000 acres of free land to any group of veterans wishing to apply. The only stipulations are that the applicants must work together in groups of 3 to 5 and use the land for agriculture and grazing. In order to be selected, the group must present a plan for how they will use the 1,000 acres. This plan must be presented by _____ in order to be considered. Please list the members of the group on the plan.

With best regards for a successful venture,



Andrew Jackson

President of the United States

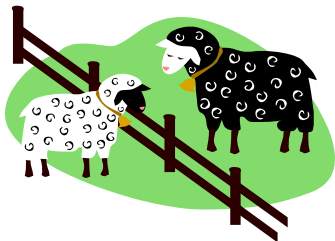


Activity 4.7 ~ Free Land Brainstorming Activity



We Already Know...

What We Need to Know...



Where Can We Find This Information?

Resource:

Homestead National Monument of America – Free Land! Free Land!

<http://www.nps.gov/home/>



The Name of Our Farm
Community is

And these are the members:

Our Plan for the 1,000 Acres is:

Background for the Mathematics Using the Census Data

Population Census Growth 1820 - 1850
Illinois became a state in 1818

1820 Census (22 States and Territories)

7 August 1820
Total Population: 9,638,453

1830 Census (28 States and Territories)

1 June 1830
Total Population: 12,866,020

1840 Census (30 States and Territories)

1 June 1840
Total Population: 17,069,453

1850 Census (36 States and Territories)

1 June 1850
Total Population: 23,191,876

Create a chart showing the growth of the population from 1820 to 1850
Create a chart showing the growth of the states from 1820 to 1850

<http://www.iltrails.org/1850censusschedule.html> 1850 Census Schedule of social statistics
Sangamon County Census 1850 <http://www.iltrails.org/1850censusschedule.html>

Using the 1875 Plat Map of Menard County, finding Petersburg – determine where you think New Salem Village was located... hint: find the Sangamon River.

<http://iltrails.org/menard/map1875.html>

1875 Plat Map of Menard County

<http://69.6.196.247/menard/> Menard Co. Census and Information

New Philadelphia Census Data <http://69.6.196.247/menard/>

Using the following web page create charts showing totals of the following information: <http://homepages.rootsweb.com/~xrysta/1850SangamonIL/sag9.htm>

This page holds the information for Abraham Lincoln's family in 1850

Occupations

Sex

Race

Birthplace

How many children are in school, determine approximately what grade based on the children's age

Value of their property

Census – Collecting data to answer the question: “Who is an immigrant?”

Ask students to construct a short questionnaire to collect information. They will be using this questionnaire for students in their own grade, the grade above and the grade below about ethnic/racial groups that make up their school population.

What questions do they need to ask?

Create a list of up to eight questions that students can use to poll the students.

Students need to discuss the kinds of questions they wish to ask to gain information about immigration history. Students will need permission from the students they ask questions of before they begin the questionnaire and will not use the respondents' names.

Ideas for sharing the information:

Students can

- Construct graphs or charts to present the data.
- Use world maps to calculate distances traveled.
- Compare stories of the classroom students of their family's
- Immigration or migration from other parts of the country.
- Interview the oldest female family members about why – either they immigrated or their family immigrated to the United States. For students who are focusing on migration from other parts of the country, ask the same kinds of questions about the move.
- Track down stories of “family beginnings” such as courtship, weddings, and births.
- With parents permission have students bring the photos to school in envelopes to protect them. It is suggested that parents photocopy the pictures students bring to school. Find family photographs to show different family groups at different times through the years. Make sure these photographs are cared for and returned to the family. If the students do not have photographs, have them draw pictures of their family.



Final Question for each student to provide a written answer:

If you were immigrating to a new country, what would you take with you that means “home” to you.

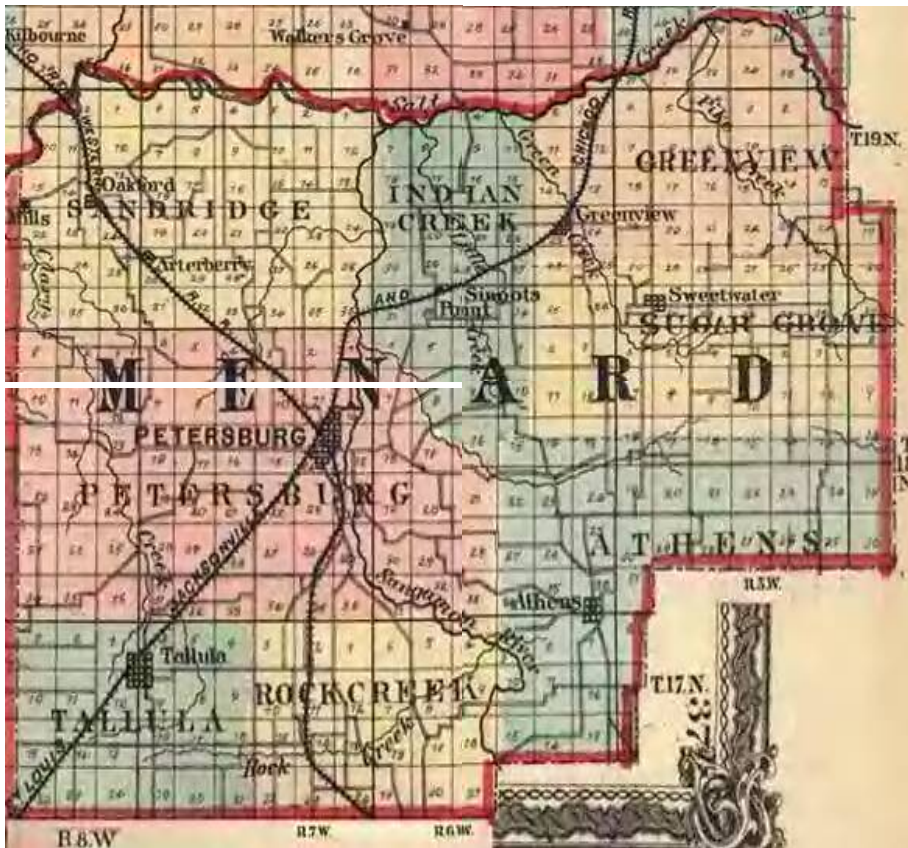
Resources for Census data and background information for the mathematics activity

Mary Lincoln Letters <http://jala.press.uiuc.edu/II/schwartz.html>

List of Journals <http://jala.press.uiuc.edu/jalaindex.html>

Sangamon County Census info

<http://www.rootsweb.com/~ilsangam/sangamon.htm>



To read more about Mary Lincoln and how she managed her home, her husband and her children, an article by Jean H. Baker is available at this web address.

<http://jala.press.uiuc.edu/II/baker.html>

Activity 4.8 ~ Abraham Lincoln's Budget

Math Lesson using the following information

Use Lincoln's family in Springfield - 6 people and his wages for one year established at \$1724.00 = \$143.67 per month. He had a cow, a horse, and a dog. Mrs. Lincoln had a housekeeper.

Find the cost of items in the 1840s and 1850s and determine what kinds of expenses most families had at that time period.

Create a budget for the Lincoln family for one year. Tell which year it is.

How Much Stuff Cost a Long Time Ago

<http://www.waynesthisandthat.com/cost.htm>

Income		Housing		Other Bills	
Source	Amount	Expenses	Amount	Expenses	Amount
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total	<input type="text"/>	Total	<input type="text"/>	Total	<input type="text"/>

Household		Household (Cont)		Savings	
Expenses	Amount	Expenses	Amount	Expenses	Amount
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
		Total	<input type="text"/>	Total	<input type="text"/>

Fill In the Budget Worksheets from Budget Worksheets

Abraham Lincoln's Family Income, Housing Expense and Other bills

Mary Todd Lincoln: Managing Home, Husband, and Children
<http://jala.press.uiuc.edu/11/baker.html>

Baker, Jean H., Mary Todd Lincoln: Managing Home, Husband, and Children. Journal of the Abraham Lincoln Association 11.NA (1990): 32 pars. 25 Feb. 2005 <<http://jala.press.uiuc.edu/11/baker.html>>. Baker, pars 4-6.

Lincoln Family Budget Worksheet

Create a List of the types of expenses a family of five would have in the 1840s and 1850s. List the title of the category of expense, what the expense is and how much it cost per month. Then you will need to research costs for items in Lincoln's time. Remember to pay for school for the children and for household help and transportation.

_____ (Expense Title)

_____ (Expense Title)

_____ (Expense Title)

_____ (Expense Title)

_____ (Expense Title)

_____ (Expense Title)

_____ (Expense Title)

Any expenses you are not sure where to add – list those here as miscellaneous but tell exactly what it was and how much it cost per month.

Miscellaneous

You cannot spend more than the total amount of income earned for the family – what will you do if your expenses are greater than the Lincoln family income?

Activity 4.9 ~ Worksheet - What's the Cost?

Name _____

Class _____

Date _____

Cost in today's dollars (a photographic portrait by Matthew Brady):

Cost in today's dollars (a telegram to Boston):

Cost in today's dollars (Daily Sun newspaper):

Cost in today's dollars (a visit to Barnum's American museum):

Costs of modern equivalent (a role of film and development):

Cost of modern equivalent (an e-mail to Boston):

Cost of modern equivalent (your local newspaper):

Cost of modern equivalent (a visit to your local natural history museum):

Cost comparison (Brady portrait versus role of film and development):

Cost comparison (telegram versus e-mail):

Cost comparison (newspaper then versus newspaper now):

Cost comparison (Barnum museum versus natural history museum):

