Hey Kid, Want to Buy A Bridge?

About the Show

There's no place like home—a hundred years ago?! Joe, Fred, Freddi, and Sam warp back to the brawling, sprawling city of New York at the end of the 19th century to witness the building of the Brooklyn Bridge, and help inspire Thomas Edison in his lab in Menlo Park, New Jersey.

Introduction

This lesson combines two different aspects of 18th century America—the building of the Brooklyn Bridge and the inventions of Thomas Alva Edison. Exploring each of these topics gives students the opportunity to not only understand the impact of the people and events, but to also understand the importance of science and technology throughout history.

Historical Background

The Age of Invention

Life in late 19th century America was dramatically different than it had been for previous generations. Industries grew and expanded, people moved from the farm to the city, immigrants arrived looking for new opportunities, and the country began to establish itself as an international power. Despite economic and social progress, there were still great disparities between the rich and the poor. Mark Twain dubbed it the Gilded Age—a time when society looked prosperous on the surface, despite problems of corruption, poverty, and greed.

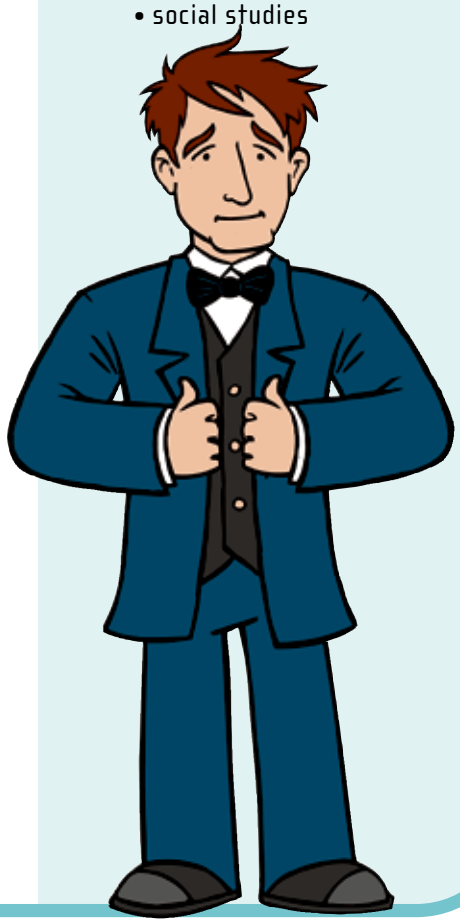
One of the reasons life changed so abruptly was because inventions and innovations allowed people to do things better and faster. Technological, scientific, and medical advances changed the way people traveled, dressed, communicated, worked, and spent their leisure time. The typewriter, telephone, camera, internal combustion engine, and even the zipper were just some of the many things that

Curriculum Connections

- American history
- Brooklyn Bridge
- Gilded Age
- Industrial Revolution
- inventors
- science
- Thomas Alva Edison

Subject Areas

- language arts
- media studies
- science
- social studies



Historical Background *continued*

changed people's lives at home, at work, and at play. When the United States celebrated its 100th anniversary in 1876, the Centennial International Exhibition in Philadelphia featured over 12,000 awards for new technology.

One of the major contributors to this Age of Invention was Thomas Alva Edison, "the wizard of Menlo Park," who pioneered the incandescent light bulb in the 1870s. Edison also invented the phonograph, the motion picture camera, the fluoroscope, and many other devices we use every day. Edison received a total of 1,093 patents, the most ever issued to one person by the U.S. patent office.

The Brooklyn Bridge

After the Civil War, John Roebling, one of America's greatest civil engineers, began his ambitious project of linking the two cities of Brooklyn and Manhattan. The story of the building of the bridge is as fascinating as the structure itself. Roebling's son, Washington, took over after his father died in an accident. Washington, who worked with the men digging the foundation under the East River, developed caisson disease, an illness that affects underwater divers or diggers when they resurface too quickly. Unable to resume direct supervision of the building of the bridge because he was partially paralyzed, Washington's wife, Emily, took over, conveying her husband's instructions and managing the workmen. When the Brooklyn Bridge—which in many ways embodies the industry, energy, and optimism of the late 19th century—opened in 1883, it was hailed as the "Eighth Wonder of the World."

Want students to get even more excited about history?



Check out the Inventors adventure for kids at

www.timewarptrio.com/adventures/brooklyn/

Put It Back, Jack! and other interactive games to play.

Plentifax 487—the ultimate time traveler's guide—gives facts about inventors, inventions, and more!

Cool Books that kids will love.

Activity 1

Create An Infomercial

In this activity, students gather information about an invention. Then, working in pairs, they create an "infomercial" to sell the product or service.

Instructions

1. As a class, brainstorm a list of inventors and their inventions. You may want to limit the list to 19th century inventions, or expand it to include ancient times and the present. You may also want to include innovators (such as Amelia Bloomer). Be sure that the list includes a diverse range of people. (You may want to provide a list ahead of time.)
2. Organize students into pairs. Have each pair pick an invention or creation that they want to "sell" to the rest of the class. Partners will work together to create an infomercial.
3. Have partners fill out the "Planning Worksheet" handout. After students complete their worksheets, review their plans with them.
4. If possible, work with the media studies department to help students videotape their infomercials. Students can also perform their infomercials for the class.
5. As students watch each infomercial, ask them to write down the name of the inventor and invention, the year of the invention, and the three ways this invention changed the way people lived.



Objectives

- to work collaboratively
- to write a clear explanation
- to apply scientific principles to design
- to become more media literate

Materials

- art and writing supplies
- costumes, props, sound effects, and music
- "Planning Worksheet" handout
- video recording equipment (optional)

Curriculum Standards

- **NCSS**
  Time, Continuity, & Change: Demonstrate an understanding that people in different times and places view the world differently.
  Production, Distribution, & Consumption: Explain and illustrate how values and beliefs influence different economic decisions.
  Science, Technology, & Society: Demonstrate how changes in values, beliefs, and attitudes result in new scientific and technological knowledge.
- **NCTE**
  Students adjust their use of spoken, written, and visual language (e.g. conventions, style, vocabulary) to communicate effectively with a variety of audiences for different purposes.

Planning Worksheet

Names _____

Inventor _____ Invention/Year _____

As you and your partner begin to plan this project, use this sheet to organize your work. Be sure to divide the tasks evenly.

In the spaces provided, place the name of the student(s) who will be responsible for this part of the project and identify a date when you will meet your responsibilities.

1. Research the inventor and invention.

   Who will do this? _____

   Date due _____

2. Create, build, draw, or copy a 3D replica of the invention. To do this you must locate a picture of the invention and a description of how the invention works.

   Who will do this? _____

   Date due _____

3. Include a description of how this invention will make a difference in the lives of the consumers who buy your product.

   Who will do this? _____

   Date due _____

4. Write a script together. Remember you want to sell your product. Mention the product's price, its special features, and why people should buy or use it.

   Who will do this? _____

   Date due _____

5. Introduce yourself in the infomercial by giving a brief background about yourself speaking in the first person. Include the following information: birth, location, family life, and an explanation of how you came up with the idea for this invention.

   Who will do this? _____

   Date due _____

6. Create a catchy slogan for your product, something that will stick in the potential consumer's mind.

   Who will do this? _____

   Date due _____

7. Together, make a list of the props, music, graphics, and costumes you will use in your infomercial.

   Who will do this? _____

   Date due _____

8. Create a schedule to rehearse and complete your infomercial. Be ready to present and/or film your infomercial on your due date!

   Who will do this? _____

   Date due _____

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Activity 2



Invention Convention

Inspire your students to invent something that makes the world a better place. Then hold a Great Exhibition to have students present their ideas.

Instructions

1. Ask students to pretend they have been invited to participate in their own Great Exhibition. Their assignment is to invent something that makes the world a better place. It might be small or huge. It can benefit one person or a whole population.
2. Have students work in pairs or teams. After they have decided on their invention, have them provide the following information: name and purpose of invention, diagram of what it is and/or how it works, and what the benefits are. Review the invention with each team or pair.
3. After the inventions have been approved, have the teams or pairs create an article, news release, poster, review, advertisement, or marketing plan for their invention. Students should clearly demonstrate the benefits of their invention, how it works, and why it is superior to existing technology.
4. Hold a class Great Exhibition. Invite the pairs or teams to present their invention plan to the class. You may want to distribute an award to each entry. Afterwards, publish a class Great Exhibition pamphlet that shows the inventions.

Take It Further

Have students investigate the process for applying for a patent for a new invention. (Check out the home page of the U.S. Patent and Trademark Office at www.uspto.gov.) You may want to choose one or more of the inventions from the Great Exhibition and pretend to apply for a patent.

Objectives

- to use research, organizational, and creativity skills
- to create interesting and memorable displays
- to identify the science or technology behind an invention

Materials

- art and writing supplies

Curriculum Standards

- **NCSS**
  Science, Technology, & Society: Students can describe examples in which values, beliefs, and attitudes have been influenced by new scientific and technologial knowledge, such as the printing press, etc.
- **NCTE**
  Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

Resources

Recommended Books

For Teachers

The Book of Inventions
by Ian Harrison.
(National Geographic, 2004)
A detailed compendium of inventions, inventors, and their histories.

Great Bridge: The Epic Story of the Building of the Brooklyn Bridge
by David McCullough. (Simon & Schuster, 1993) The personal and public story of the Roeblings and the building of the bridge.

New York: An Illustrated History
by Ric Burns, James Sanders, and Lisa Ades. (Knopf, 2003)
Over 500 illustrations enhance the history of the city in this companion volume to the PBS series.

Old Brooklyn in Early Photographs, 1865–1929 by William Younger. (Dover, 1978) A wealth of photographs show the variety and vitality of Brooklyn's early years.

A Picture History of the Brooklyn Bridge: With 167 Prints and Photographs by Mary J. Shapiro. (Dover, 1983) The book presents an illustrated account of the building of the bridge with contemporary photos and engravings.

Scientific American Inventions and Discoveries by Rodney Carlisle. (Wiley, 2004) Filled with facts, this is a look at the origins of 418 inventions and 100 discoveries about nature.

They Made America: Two Centuries of Innovaors from the Steam Engine to the Search Engine
by Harold Evans. (Little, Brown, 2004)
A companion to the PBS series, this book profiles 79 of America's leading inventors, entrepreneurs, and innovators.

For Students

Fiction

101 Ways to Bug Your Teacher
by Lee Wardlaw. (Dial, 2004)
Steve "Sneeze" Wyatt is trying to come up with a project for the History Faire. Fortunately, he has a great group of friends who can help.

The Amazing Thinking Machine
by Dennis Haseley. (Dial, 2002)
Patrick and his older brother Roy escape the troubles of the Great Depression by inventing a thinking machine that can answer any question it is asked.

Ben and Me by Robert Lawson.
(Little, Brown, 1988)
A classic story about Benjamin Franklin and his inventions, told from the perspective of his pet mouse.

Clever-Lazy, the Girl Who Invented Herself by Joan Bodger.
(Tundra, 1997) Set in ancient China, this is a story about the invention of gunpowder.

The Edison Mystery by Dan Gutman.
(Simon & Schuster, 2001)
Qwerty Stevens, Back in Time series. Set in the 21st century, Qwerty discovers a box buried by Thomas Edison. Does it really contain a machine that will allow communication with people from the past?

Hey Kid, Want to Buy a Bridge?
by Jon Scieszka. Illustrated by Adam McCauley. (Puffin, 2002)
When the Trio gets stuck on top of the half-finished Brooklyn Bridge, they have to find a way out of 1877 Brooklyn without un-inventing the lightbulb, the phonograph, and—oh no—baseball!

A House of Tailors
by Patricia Reilly Giff. (Wendy Lamb Books, 2004) As the Brooklyn Bridge is being constructed, 13-year-old Dina tries to adjust to her new home in Brooklyn after immigrating from her native Germany. For older readers.

Leonardo and the Flying Boy
by Laurence Anholt. (Barron's, 2000)
Zoro, Leonardo da Vinci's apprentice, tells about his master's drawings, writings, paintings, and inventions. For younger readers.

Leonardo's Hand by Wick Downing.
(Houghton Mifflin, 2001)
Leonard Smith, who has come to live with Anna Swedenborge after many foster homes, teams up with her granddaughter Julie and a mysterious 500-year-old spirit to enter an inventor's contest. For older readers.

Lights, Camera, Edison!
by Gretchen McMasters.
(Stargazer, 2004) A creature named Aesock takes Benjamin and Olivia back to the time of Thomas Edison. (Note: This book is written in Spanish as well as English—just turn it around!)

Resources

Twenty-one Elephants
by Phil Bildner. (Simon & Schuster, 2004) Now that the Brooklyn Bridge is finally finished, Hannah wants to walk across it, but everyone thinks it's too dangerous.

Nonfiction

African American Inventors
by Otha Richard Sullivan. (Wiley, 1998)
The "Black Stars" series. Chronicles the achievements of 25 innovators, from George Washington Carver to John P. Moon, inventor of floppy disks.

Brainstorm! The Stories of Twenty American Kid Inventors
by Tom Tucker. (Sunburst, 1998)
From colonial days to the present, kids have invented lots of things from the practical (Chester Greenwood's earmuffs) to the purely delicious (Frank W. Esperson's popsicle).

Bridges: From My Side to Yours
by Jan Adkins. (Roaring Brook, 2002)
From simple stepping stones to complex reinforced steel and concrete, this book uses pen-and-ink drawings to present a variety of bridges from different perspectives.

Brooklyn Bridge by Lynn Curlee. (Atheneum, 2001) The tragedies and triumphs that are part of the story of the construction of the Brooklyn Bridge are depicted in stunning paintings.

The Brooklyn Bridge
by Elizabeth Mann. (Firefly, 1996)
Without the talented and determined Roebling family—John, Washington, and Emily—the bridge would never have been completed.

Girls Think of Everything! Stories of Ingenious Inventions by Women by Catherine Thinmesh. (Houghton Mifflin, 2000)
Girls really *do* think of everything: windshield wipers, Kevlar®, Liquid Paper®, paper bags, and so much more! See also *The Sky's the Limit: Stories of Discovery by Women and Girls* by the same author.

Inventing the Future: A Photobiography of Thomas Alva Edison by Marfé Ferguson Delano. (National Geographic, 2002)
Photographs document Edison from his childhood to his many accomplishments.

Inventors by Martin W. Sandler. (HarperTrophy, 1999)
Posters, paintings, and photographs show the range of inventions that Americans have given the world: washing machines, airplanes, communications systems, and more.

The Kids' Invention Book by Arlene Erlbach. (Lerner, 1997)
Thirteen kids and their inventions are described and pictured in photographs. Includes information on applying for patents, entering invention contests, and other practical advice.

Mistakes That Worked by Charlotte Foltz Jones. (Doubleday, 1994)
Accidents have produced all sorts of useful things—from paper towels to penicillin—in this account of 37 inventions.

So You Want to Be an Inventor?
by Judith St. George. (Philomel, 2002)
Humorous pictures and intriguing anecdotes introduce a variety of American and European inventors.

What a Great Idea! Inventions that Changed the World
by Stephen Tomecek. (Scholastic, 2003)
A history of the origin of important inventions through the ages.

Web sites

THE BIG BRIDGE SCHEME: THE BUILDING AND IMPACT OF THE BROOKLYN BRIDGE
thirteen.org/edonline/ntti/resources/lessons/history.html
This lesson plan helps students study the development, construction, and legacy of the Brooklyn Bridge, and contains primary sources.

BUILDING BIG
pbs.org/wgbh/buildingbig/index.html
Explore large structures and what it takes to build them with *Building Big*™, a five-part PBS television series and Web site.

THE INVENTIONS OF THOMAS EDISON
inventors.about.com/library/inventors/bledison.htm
The site provides articles and links about Thomas Edison's life and inventions.

MOTHERS OF INVENTION
historychannel.com/classroom/guides
This site highlights women inventors from the 18th century to the present, and includes science, technology, and consumer goods.

Resources

A SCIENCE ODYSSEY
pbs.org/wgbh/aso/
This site has extensive information about people and discoveries of the past century.

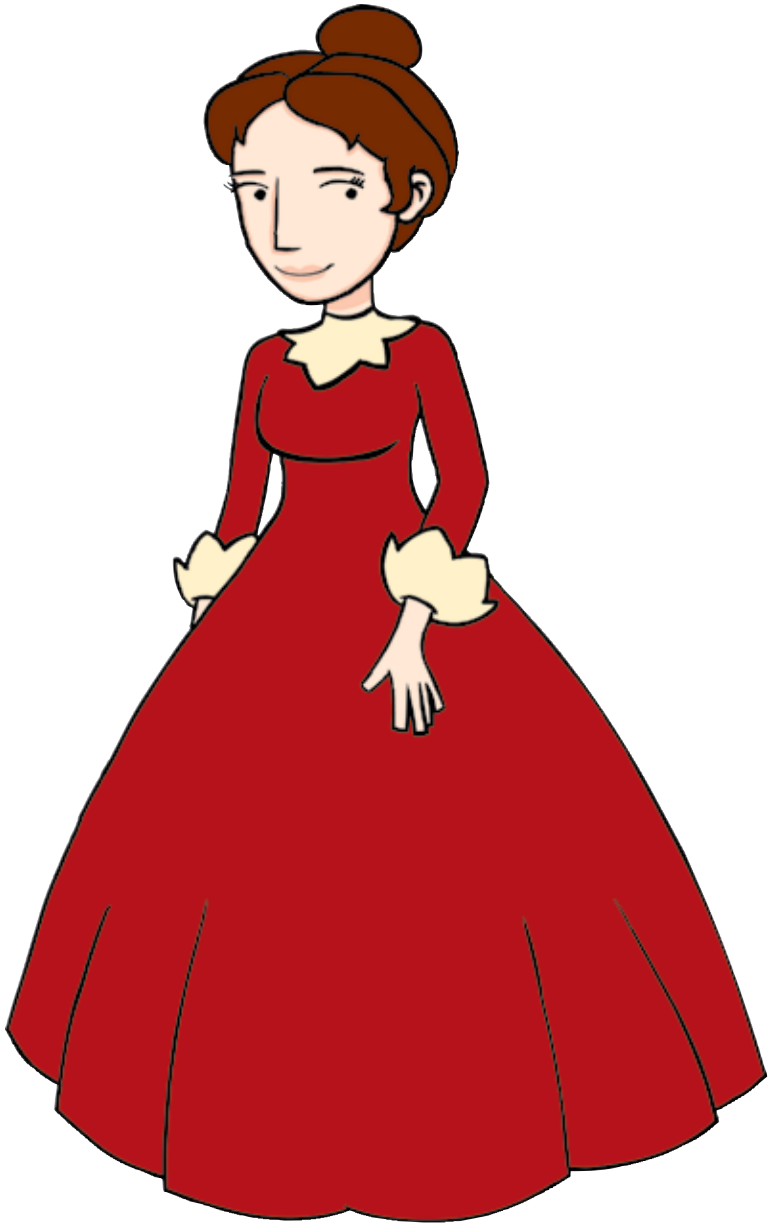
SUPER BRIDGE
pbs.org/wgbh/nova/bridge/
This companion site to the television show *Super Bridge* chronicles the building of the state-of-the-art Clark Bridge over the Mississippi River. Test your engineering skills by matching the right kind of bridge to different locations.

THOMAS EDISON'S HOMEPAGE
www.thomasedison.com/
This site contains quotes, photographs, and a biography of this prolific inventor.

TIME WARP TRIO
www.timewarptrio.com
This site for kids includes interactive games, fascinating facts, and booklists that help make the past come alive.

THE UNITED STATES PATENT AND TRADEMARK OFFICE KID PAGES
www.uspto.gov/go/kids
This site contains news and information about inventions, patents, and policies. A special section for kids includes a history of inventions and a calendar that shows what was trademarked or patented on each day of the year.

Please note:
Although these sites were verified at the time of publication, Web site addresses and content are frequently subject to change.



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