

- In Franklin's newspaper, *The Pennsylvania Gazette*, and in *Poor Richard's Almanac*, he tried to give suggestions that would help people succeed in both business and in life. Ask students to research some of Franklin's famous advice at the following Web site: www.geocities.com/Athens/Oracle/6517/361.htm, and to attempt to write some witty sayings of their own.
- To introduce students to the concept of electricity, allow them to explore materials used in creating a simple electric circuit. Distribute among pairs of students a 9-volt battery, insulated copper wire, one battery holder, two brass battery clips and one small flashlight bulb. After students have successfully created a simple circuit, discuss with them where the electricity comes from, where it goes and how it lights the bulb. Have students draw diagrams that are accompanied by explanations of their investigations. See Keith Good's *Zap It: Exciting Electricity Activities* (Lerner Publications, 1999) or Michael DiSpezio's *Awesome Experiments in Electricity and Magnetism* (Sterling Publications, 1998) for more details.
- Franklin's brother James was arrested for printing articles in his newspaper that were critical of the British Royal Governor. This was a time before the Bill of Rights and the First Amendment guaranteeing freedom of the press. Ask students to research the trial of John Peter Zenger, the verdict of which challenged the notion that material printed in colonial newspapers could be censored. (See www.law.umkc.edu/faculty/projects/trials/zenger/zenger.html for an informative Web site about this topic.) Engage students in a follow-up discussion on the importance of a free press in society.
- Franklin is credited with creating the first political cartoon in 1754. Entitled "Join or Die," the cartoon expressed Franklin's views that the colonies must unite in order to survive. Students can find the cartoon at the following Web site: www.geocities.com/Athens/Styx/1070/1751/joindie.htm. Ask students to create a political cartoon that captures their opinion of a current event or issue that is important to them.

Suggested Internet Resources

Periodically, Internet Resources are updated on our Web site at www.LibraryVideo.com

- sln.fi.edu/franklin/rotten.html
The Franklin Institute of Philadelphia maintains an extensive site devoted to the life, times and achievements of Franklin.
- www.ushistory.org/franklin
This site, created by the Independence Hall Association, presents information about Franklin as part of a larger effort to tell the story of the events that led to the creation of the United States. (Continued)

- library.thinkquest.org/22254/home.htm
Three high school students created this award-winning Web site as part of a student competition. It does an unusually good job of telling Franklin's story from the perspective of students, while also providing an example of what young people can accomplish through hard work.
- odur.let.rug.nl/~usa/B/bfranklin/frankxx.htm
This site contains the full text of Benjamin Franklin's autobiography.

Suggested Print Resources

- Franklin, Benjamin. *Poor Richard's Almanac*. Peter Pauper Press, Mt. Vernon, NY; 1983.
- Giblin, James. *The Amazing Life of Benjamin Franklin*. Scholastic Trade Books, New York, NY; 2000.
- Lawson, Robert. *Ben and Me*. Little Brown, Boston, MA; 1988
- Rudy, Lisa Jo (ed.) *The Ben Franklin Book of Easy and Incredible Experiments*. Wiley, New York, NY; 1995.

TEACHER'S GUIDE

Jim Quinn

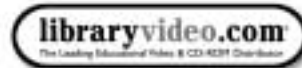
Writer-in-Residence

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BENJAMIN FRANKLIN

This guide is a supplement designed for teachers to use when presenting programs in the video series *Inventors of the World*.

This series focuses on famous inventors who have helped change the course of history with their groundbreaking ideas. Programs in this series stress that the process of inventing is much more than a quick "eureka" moment, and is more likely the culmination of a great deal of hard work and experimentation. These programs also dispel the notion that advancements in science occur only due to the work of a lone, isolated genius and illustrate how the great inventors of history often "stood on the shoulders of giants" and improved upon the work of others. In addition to documenting the inventors and their process of invention, this series also highlights how new technologies influenced society at the time of their inception and how they continue to shape our modern world.



Historical Overview

Benjamin Franklin stands as an important historical figure because of the unusually wide-ranging influence that he had on events of the 18th century. Although he's best known for his role as a Founding Father of the United States, Franklin began his life as a printer and businessman who not only made important contributions to science, but also made his community a better place.

As an inventor, Franklin made several lasting contributions. His inventions such as a wood-burning stove, bifocal eyeglasses and the lightning rod showed his ability to recognize a problem and design a practical solution. His most significant scientific accomplishment may have been his experiments on the nature of electricity and his development of many of the terms that we use when we discuss electricity.

Franklin dedicated much of his time to public service and civic improvement. He promoted education through the establishment of public libraries and private academies, which addressed public health and safety by helping to start the nation's first hospital and fire department. He also wrote best-selling publications like Poor Richard's Almanac, which provided colonial people with sound advice on how to become successful Americans.

Driven by his great curiosity and his desire to make the world a better place, Franklin invented many useful, practical and important things. And driven by his patriotism and supported by his immense skills as a diplomat, he helped to create what might be the greatest of all his inventions — the United States of America!

Time Line

1706 — Ben Franklin is born in Boston, Massachusetts.

1723 — Franklin leaves his family and goes to Philadelphia.

1728 — Franklin starts his own printing business.

1732 — The first edition of Poor Richard's Almanac is published.

1736 — Franklin organizes the first fire company.

1742 — The Franklin stove is invented.

1747 — Franklin first writes about his theories on electricity.

1748 — Franklin sells his printing business so he can concentrate on invention and other pursuits.

1752 — Franklin performs historic electrical experiments, including the famous kite experiment.

1752 — With the help of Franklin, the first hospital in America opens in Philadelphia.

1776 — Franklin helps write the Declaration of Independence.

1783 — Franklin signs The Treaty of Paris, which ends the American Revolutionary War.

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1787 — Franklin signs the United States Constitution.

1790 — Benjamin Franklin dies at age 84.

Vocabulary

Revolutionary War — The 18th-century war for American independence from England.

apprentice — A person who learns a trade, craft or art from working with a skilled person in his or her field.

almanac — An annual publication containing useful and entertaining facts, including a calendar, information about seasons, weather, planting and tides.

Gulf Stream — A warm ocean current flowing in the North Atlantic Ocean.

Leyden jar — An early scientific instrument that could store electricity.

positive, negative, battery — Electrical terms that Franklin developed during his experimental work with electricity.

charge — The presence of electrical energy.

conductors — Materials that allow electricity to flow freely.

lightning rod — A device that protects buildings from lightning damage.

glass armonica — A musical instrument that produces tones by touching glass bowls rotating on a spindle.

bifocals — Eyeglasses that feature a compound lens in which the upper portion focuses on distant subjects, while the lower portion focuses on nearby subjects.

Pre-viewing Discussion

• In addition to being a scientist and inventor, Franklin dedicated much of his life to the progress and improvement of the city of Philadelphia. Ask students to imagine that they are setting out to make improvements in their own community and to brainstorm ways to make their area a better place to live. What would be the most important developments that students think would make their neighborhood, town or city a better place to live and why? How would students implement their changes?

• Franklin recognized the importance of sharing scientific ideas but lived in the days before the telephone, Internet and speedy, long-distance travel. Ask students to discuss the communication and transportation barriers that Franklin faced in the 18th century and the importance of having instant access to information. How might things have been different if Franklin had had access to modern-day improvements in the areas of communication and transportation?

• The nature of electricity fascinated people in the 18th century, despite the fact that there was no known practical use for electricity at that time. Have students discuss what their lives would be like without electricity and electrical appliances.

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Focus Questions

1. What was Franklin's role as a printer in the 18th century?
2. How did Franklin get his essays published in the New England Courant?
3. What was the "Junto," and why did Franklin start it?
4. How did people use Poor Richard's Almanac?
5. What was Franklin's motivation for inventing and solving problems?
6. What electrical terms did Franklin invent?
7. How did lightning rods protect buildings from lightning strikes?
8. Why did Franklin spend so much time in Europe?
9. Why did Franklin propose adjusting our clocks at various times each year?
10. How do bifocals work? Why did Franklin invent them?

Follow-up Discussion

- Review with students the list of Franklin's significant inventions, including his stove, lightning rod and bifocals, and his community development ideas in areas such as health, education and safety. Ask the students which of these developments were the most important, and why?
- Franklin was a printer, writer, inventor and statesman. Ask students to think of other people from history who were as well-rounded as Franklin and to consider if there are people today who are very successful in a wide variety of fields.
- Franklin wrote late in his life that he would love to be able to return to America a hundred years after his death. Ask students to imagine and discuss how Franklin would react to seeing America today.

Follow-up Activities

- Experiment with the technology behind the armonica. Start by having your students experiment with half-full water glasses by wetting their finger tips and rubbing them along the rims of the glasses; goblets with thin sides will produce more volume than thicker types of glasses. Have the students experiment with the way changing the amount of water in the glass affects the tone. If possible, try to 'tune' a set of glasses so you can play simple melodies. Try and obtain a recording of an armonica performance (available at libraries and from the Franklin Institute in Philadelphia) to demonstrate what the instrument sounds like when played by an accomplished musician. (See sln.fi.edu/franklin/musician/virtualarmonica.html for an online glass armonica that students can play.)
- American ship captains in the 18th century knew they could get to Europe faster by traveling in the Gulf Stream, named by Franklin. Franklin was intrigued by this "underwater stream" and attempted to chart its course. Ask students to research the Gulf Stream and ask them to develop a map of it and to write a report on its effect on ocean travel, weather and the environment.

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