DEC. 31, 1879: EDISON DEMONSTRATES INCANDESCENT LIGHT

Biographies, discussion questions, suggested activities and more
Edison was far from the first person to develop an incandescent light, which was first patented in England in 1841 by Frederick de Moleyns. In the ensuing four decades, however, numerous inventors failed to produce a safe, bright and affordable bulb that could stay lit for more than a few minutes at a time. Edison threw himself into the challenge of developing a commercially viable incandescent light in 1878, and investors in the Edison Electric Light Company provided him with the necessary seed money. The 31-year-old inventor sought to develop not only a working bulb, but an entire lighting system powered by a generator.

Edison bragged that he would have a viable bulb ready in just months, but he soon found himself stymied like the inventors who came before him. Inside the laboratory on his 34-acre research-and-development campus at Menlo Park, Edison and his 20- to 30-person team of young assistants succeeded in creating a vacuum with no more than a 1-millionth part of air that allowed a platinum filament to light without catching fire, but Edison consigned it to the “cemetery of inventions” because the metal was too costly. Turning to cheaper carbon filaments, Edison tested raw silk, cork and even the beard hair of two of his employees with little success, before making his big breakthrough in October 1879.
In the first public demonstration of his incandescent light bulb, American inventor Thomas Alva Edison lights up a street in Menlo Park, New Jersey on December 31, 1879. The Pennsylvania Railroad Company ran special trains to Menlo Park on the day of the demonstration in response to public enthusiasm over the event.

Although the first incandescent lamp had been produced 40 years earlier, no inventor had been able to come up with a practical design until Edison embraced the challenge in the late 1870s. After countless tests, he developed a high-resistance carbon-thread filament that burned steadily for hours and an electric generator sophisticated enough to power a large lighting system.

Born in Milan, Ohio, in 1847, Edison received little formal schooling, which was customary for most Americans at the time. He developed serious hearing problems at an early age, and this disability provided the motivation for many of his inventions. At age 16, he found work as a telegraph operator and soon was devoting much of his energy and natural ingenuity toward improving the telegraph system itself. By 1869, he was pursuing invention full-time and in 1876 moved into a laboratory and machine shop in Menlo Park, New Jersey.

Edison’s experiments were guided
by his remarkable intuition, but he also took care to employ assistants who provided the mathematical and technical expertise he lacked. At Menlo Park, Edison continued his work on the telegraph, and in 1877 he stumbled on one of his great inventions—the phonograph—while working on a way to record telephone communication. Public demonstrations of the phonograph made the Yankee inventor world famous, and he was dubbed the “Wizard of Menlo Park.”

Although the discovery of a way to record and playback sound ensured him a place in the annals of history, the phonograph was only the first of several Edison creations that would transform late 19th-century life. Among other notable inventions, Edison and his assistants developed a forerunner of the movie camera and projector in the late 1880s. In 1887, he opened the world’s first industrial research laboratory at West Orange, New Jersey, where he employed dozens of workers to systemically investigate a given subject.

Perhaps his greatest contribution to the modern industrial world came from his work in electricity. He developed a complete electrical distribution system for light and power, set up the world’s first power plant in New York City, and invented the alkaline battery, the first electric railroad and a host of other inventions that laid the basis for the modern electrical world. One of the most prolific inventors in history, he continued to work into his 80s and acquired 1,093 patents in his lifetime. He died in 1931 at the age of 84.

DID YOU KNOW?

Thomas Edison averaged one new patent every two weeks of his adult life.
In his 84-year lifetime, Thomas Edison acquired a record 1,093 patents (singly or jointly) and was the driving force behind such innovations as the phonograph and one of the earliest motion picture cameras, in addition to the incandescent light bulb. He also created the world’s first industrial research laboratory. By the time he was in his 30s, Edison had become one of the most famous men in the world. In addition to his talent for invention, Edison was also a successful manufacturer and businessman who was highly skilled at marketing his inventions—and himself—to the public.

In 1841, British inventor Frederick de Moleyns became the first person to be granted a patent for an incandescent bulb. In his design, an electric current heated charcoal between two platinum wires in an evacuated glass tube. The design failed to gain a following because the platinum was too expensive and the bulb burned out too quickly to be commercially viable.

British physicist Joseph Swan actually developed a working incandescent bulb with a carbon filament in early 1879, nearly a year before Edison. As with the de Moleyns design, Swan’s bulb burned out too quickly to be an affordable solution. In addition, Swan’s bulbs built up soot on the interior of the glass, which dimmed the light. However, Swan held British patents to some of the technology used in Edison’s bulbs, and the two partnered in 1883 to sell lamps under the name “Ediswan.”
SEE IT

Edison's incandescent light bulb design, 1881
DEC. 31, 1879 ∙ EDISON DEMONSTRATES INCANDESCENT LIGHT

This Day in History

Dec. 31, 1879 ∙ Edison demonstrates incandescent light

Edison's light bulb drawings, 1886

Portrait of Thomas Edison by Herbert Sydney

Thomas Edison, 1878

Patent design of the Edison Electric Lamp
BATTLE OF LITTLE BIGHORN

The Battle of the Little Bighorn, fought on June 25, 1876, near the Little Bighorn River in Montana Territory, pitted federal troops led by Lieutenant Colonel George Armstrong Custer against a band of Lakota Sioux and Cheyenne warriors. Tensions between the two groups had been rising since the discovery of gold on Native American lands. When a number of tribes missed a federal deadline to move to reservations, the U.S. Army, including Custer and his 7th Cavalry, was dispatched to confront them. Unaware that the number of Indians fighting under the command of Sitting Bull approached 3,000, Custer and his 200 men were all killed in what became known as Custer’s Last Stand. Little Bighorn was the most decisive Native American victory in the long Plains Wars. Within five years, however, almost all of the Sioux and Cheyenne would be confined to reservations.

RECONSTRUCTION ENDS

In 1877, the period of American history known as Reconstruction came to an end. The Union victory in the Civil War may have given some 4 million slaves their freedom, but the process of rebuilding the South during the Reconstruction period introduced a new set of challenges. New Southern state legislatures passed restrictive “black codes” to control the labor and behavior of former slaves and other African Americans. Outrage in the North over these codes led to the triumph of the more radical wing of the Republican Party in Congress. During what became known as Radical Reconstruction, which began in 1867, newly enfranchised blacks gained a voice in American government for the first time, winning election to Southern state legislatures and even to the U.S. Congress. In less than a decade, however, reactionary forces—including the Ku Klux Klan—would reverse these changes in a violent backlash that restored white supremacy in the South.

BROOKLYN BRIDGE COMPLETED

Completed in 1883, the Brooklyn Bridge looms majestically over New York City’s East River, linking the boroughs of Manhattan and Brooklyn. It was the world’s very first steel wire suspension bridge, boasting the longest span in the world: 1,600 feet from tower to tower. The bridge’s construction took 14 years, cost $15 million (more than $320 million in today’s dollars) and involved 600 workers, at least two dozen of which were killed in the process. Upon its completion, the Brooklyn Bridge was dubbed the “eighth wonder of the world,” and for several years it was the tallest structure in the Western hemisphere.
In what ways do you think the advent of electric light changed people's lives?

Does it surprise you that many different people helped work toward the invention of the incandescent light bulb? Why or why not? Why do you think Edison gets most of the credit?

The invention of the light bulb had a significant impact on the way people around the world live. Can you think of other inventions that had a similar impact?
I WAS THERE

Ask students to research Edison’s public demonstration of the incandescent light bulb at Menlo Park. Then, have them imagine that they were present at the event, and write a letter to a friend describing it and how they think life will change because of Edison’s invention.

DARK OF NIGHT

Ask students to research what life was like before the advent of electric light. Then, have them imagine they are an entrepreneur, and create a plan for a new business, product or service that would take advantage of the new light. The plan should address the advantages and benefits of the new business, as well as an example (drawing, poster, etc.) of how they would market it to customers.

EDISON’S WIZARDRY

Assign students to form small groups and have each group research and prepare a presentation on one of Edison’s inventions, including the creative process and the invention’s impact. Topics can include the incandescent light bulb; phonograph; kinetograph and kinetoscope; alkaline storage battery; mimeograph machine; and Edison’s electrical power system.
RESOURCES

Video: Thomas Edison

Video: Ask History: Who really invented the light bulb?

Video: Edison’s Failed Inventions
http://www.history.com/topics/inventions/thomas-edison/videos/edisons-failed-inventions

Audio: Thomas Edison Talks about the Development of Electricity
http://www.history.com/topics/inventions/thomas-edison/speeches/thomas-edison-on-the-development-of-electricity

Website: Lighting a Revolution, Smithsonian Institution
http://americanhistory.si.edu/lighting/index.htm

Images: Edison’s Papers from Rutgers University
http://edison.rutgers.edu/docsamp.htm