From Punched Cards to IBM: Early Invention & Technology

Grades: 6-8
Subject: Science: Embedded Technology and Engineering

Primary Source Used

Title: Plate, punch card, and instructions for Herman Hollerith's Electric Sorting and Tabulating Machine, ca. 1895.
Link: http://lcweb2.loc.gov/cgi-bin/query/r?ammem/mcc:@field(DOCID+@lit(mcc/023))

Activities

1. Read the information about Hollerith's electric tabulating machine at the link above and on the primary source image. Discuss with the class:
   - What similarities and differences do you see between Hollerith's machine and today's computers?
   - What are the different parts depicted in these drawings, and are they still in use today?
   - What were the intended uses for these early technological inventions? Do we still use them for the same things?
   - How many different versions did these machines go through before they worked as intended?
2. Conduct searches in the American Memory and Prints & Photographs online image databases to find more sketches and other sources for early computers. Use search terms such as *tabulating machine*, *computer*, and *inventions*.
3. For more information, use the links to the right.

Helpful Links

- Collection Connections for the collection Words and Deeds in American History for more classroom ideas
- Science, Medicine, Exploration, and Invention for more science-related primary sources
- Invention Item List for other early inventions and technologies
- From Carbon to Computers at the Smithsonian
- Bright Ideas (scroll down to the Inventions section) from the National Archives
- Pictorial Americana: Experiments and Inventions for more primary source images
- Community Center page for Science and Invention for Wright Brothers primary sources and more helpful links

WHAT DOES THIS MEAN FOR US TODAY?

The success of Herman Hollerith's tabulating machine led him to found his own company, the Tabulating Machine Company, which later became International Business Machines Corporation, better known to us today as IBM. IBM tells the story of its history through online exhibits at its Web site. Just go to http://www-03.ibm.com/ibm/history/index.html to see images, view the timeline, and learn fun facts.

Have you ever seen a punched card used in an election? Did it look anything like the card that Hollerith used? In Tennessee today, there's a debate as to whether we should continue using punched cards for our elections, as opposed to voting in paperless elections. What are the pros and cons of using punched cards?

CURRICULUM STANDARDS

Note: These standards are for Grade 6, but are almost identical for grades 7-8.
http://www.state.tn.us/education/ci/sci/2009_10/grade_6.pdf

- **Conceptual Strand:** Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.
- **Guiding Question:** How do science concepts, engineering skills, and applications of technology improve the quality of life?
- **Grade Level Expectations:**
  - GLE 0607.T/E.1 Explore how technology responds to social, political, and economic needs.
  - GLE 0607.T/E.2 Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting.
  - GLE 0607.T/E.3 Compare the intended benefits with the unintended consequences of a new technology.
- **Checks for Understanding:**
  - 0607.T/E.3 Explore how the unintended consequences of new technologies can impact society.
  - 0607.T/E. 4 Research bioengineering technologies that advance health and contribute to improvements in our daily lives.
- **State Performance Indicators:**
  - SPI 0607.T/E.1 Identify the tools and procedures needed to test the design features of a prototype.
  - SPI 0607.T/E.2 Evaluate a protocol to determine if the engineering design process was successfully applied.
  - SPI 0607.T/E.3 Distinguish between the intended benefits and the unintended consequences of a new technology.