Grade: 8th  
Subject: Science, Social Studies, English/Language Arts  
Time Required: 2 90-minute class periods  
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OVERVIEW
Students will use primary sources from the Library of Congress Web site to examine scientific and technological innovations. The learner will research the purpose of original inventions and make comparisons to modern appliances or devices. Each student will present information to class in a Word document format. Presentations will include information from analysis forms, responses to investigative questions, and images captured from the Library of Congress.

UNDERSTANDING GOAL
Students will connect the development of specific inventions from early efforts to modern products.

OBJECTIVE
The learner will:
- Identify important inventors.
- Discuss predecessors to modern devices.
- Use primary sources to analyze specific inventions from the 19th and 20th centuries.

INVESTIGATIVE QUESTIONS
How did the modern appliances and tools we use every day originate? Who is responsible for the earliest attempts at inventing these devices? How have these inventions made our lives better (or worse?)

James D. Halloran, a fireman attached to Engine Company no. 20 of this city (N.Y.) is the inventor ... smoke mask ... [1918, detail]

MATERIALS
- Internet Access
- Index Cards – one for each assigned invention (see page 3 for list of inventions)
- Image Analysis Form
- Microsoft Word

RESOURCES
- Library of Congress Prints & Photographs Online Catalog
- Encyclopedia Britannica Online
CURRICULUM STANDARDS

Science (Embedded Technology and Engineering)
SPI 0807.T/E.3 Distinguish between the intended benefits and the unintended consequences of a new technology.

Literacy in History/Social Studies (Common Core)
CCSS.ELA-Literacy.RH.6-8.1 Cite specific textual evidence to support analysis of primary and secondary sources.
CCSS.ELA-Literacy.RH.6-8.2 Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.
CCSS.ELA-Literacy.RH.6-8.7 Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

English/Language Arts (Common Core)
CCSS.ELA-Literacy.RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
CCSS.ELA-Literacy.W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
CCSS.ELA-Literacy.W.8.2a Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
CCSS.ELA-Literacy.W.8.2b Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
CCSS.ELA-Literacy.W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
CCSS.ELA-Literacy.W.8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

PROCEDURE

Step 1 List one invention (see list below) per index card for distribution to students in Step 4. Print copies of Image Analysis Form for each student. Pair students if needed based on class size and number of computers.

Step 2 Have students list all appliances or tools they have used since getting up that morning. Brainstorm and write key devices on board.

Step 3 Lead a class discussion: Which of these inventions could you not live without? Which inventions would you like to know more about? Where do you think you could find that information?
PROCEDURE (cont.)

Step 4 Give each student (or group) an index card. Pass out Image Analysis Form to each student. Using the Library of Congress Prints and Photographs Online Catalog, students will find visual images of their assigned inventions (type name exactly as written on card), recording pertinent information and observations on the analysis form. Using the Encyclopedia Britannica, research the purpose of the invention, noting major improvements over time. Compare the original invention to the version of the product in use today. How is it different? How the same?

Step 5 Using photographs or prints, and information gathered from online research, each student will construct a Word document analyzing the original invention and its modern counterpart. Students should include images of inventions, key points from Image Analysis Form, research information, and comparison to modern devices.

Day 2

Step 6 Students (or groups) will align themselves in chronological order by date invention created or patented.

Step 7 Upon completion of Word document assignment and Image Analysis Form, information will be presented via in-class projector to class. Students will explain inventions, answering Investigative Questions (see p. 1) for their particular inventions. Teacher will list comparisons on board.

Step 8 Discuss development of inventions and comparisons with class. How different would their lives be if technology had not advanced? Using Investigative Question 3, imagine using the original invention instead of the modern counterpart.

Index Card listing (adjust listings to class size):

- Induction-balance Machine
- Dictating Machine
- New Iron Horse
- Common Road Locomotive
- Kinetoscope
- Bras Artificiel
- Smoke Mask
- Radio Phone
- Phonograph
- Columbian Press
- Selenium Camera

[View of Oldrieve's new tricycle, or the New Iron Horse, with a gentleman inside] [1882, detail]
**EVALUATION**

Use the following rubric to evaluate student participation in research and discussion.

93-100 Displays understanding of Investigative Questions, completes Image Analysis Form, uses visual aids properly, presents information to class and participates in class discussion.

85-92 Partial understanding of Investigative Questions, limited use of Image Analysis Form, uses visual aids properly, presents information to class and participates in class discussion.

75-84 Partial understanding of Investigative Questions, limited use of Image Analysis Form, improper use of visuals in presentation and little class participation.

70-74 Little understanding of Investigative Questions, Image Analysis Form only.

Below 70 Little or no attempt to complete assignment.

**EXTENSION**

- Using information gathered in research, have students predict what major inventions can be expected in the future. This can include refinements of present-day products or completely new inventions.

- Class will combine information into a PowerPoint Presentation to be broadcast over Closed Circuit Television, showing the evolution of technology.

Mr. Thomas A. Edison at radio-telephone [1922]