

A Study of the Brooklyn Bridge and How Technology Impacts Society

Lesson Plan

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Overview

It may be difficult to imagine that the building of a bridge was ever an amazing feat of technology and that some people feared using it. In the latter part of the 19th century, the Brooklyn Bridge was a marvel of a new age when it was built in New York City, New York. Society was changing quickly because of the many new technologies that were being incorporated into the daily lives of Americans during the Industrial Revolution. Not every technology was welcomed with open arms. This lesson follows the [Stripling Model of Inquiry](#) and uses the technological advances exemplified in the Brooklyn Bridge as a case-study to explore how technology impacts society and how society reacts to innovation.

Objectives

- Explore how technological advances impact society
- Collect and analyze data from primary source texts written about the societal impact of the new technology of the Brooklyn Bridge
- Compare responses to modern-day technological advances to the societal reactions regarding advances in the late 1800s
- Develop educational material campaigning in support of public acceptance of a selected technology

Time Required

Three 50 minute class periods

Recommended Grade Range

Grades 6-12

Subject / Sub-Subject

Physical Science, Social Studies, Language Arts, Technology, and Math

Standards (Common Core)

CCSS.ELA-LITERACY.RST.11-12.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CCSS.ELA-LITERACY.RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

CCSS.ELA-LITERACY.RH.11-12.1 Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.

CCSS.ELA-LITERACY.RH.11-12.10 By the end of grade 12, read and comprehend history/social studies texts in the grades 11-CCR text complexity band independently and proficiently.

CCSS.ELA-LITERACY.WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CCSS.ELA-LITERACY.WHST.11-12.9 Draw evidence from informational texts to support analysis, reflection, and research.

PREPARATION

Materials and Resources

- Printed copy for each student OR access to the interactive Analysis Tool online:
 - Analysis Tool for Sheet Music and Song Sheets: <http://www.loc.gov/teachers/primary-source-analysis-tool/>
 - Analysis Tool for Books and Other Printed Items: <http://www.loc.gov/teachers/primary-source-analysis-tool/>
 - Whiteboard or flipchart
 - Printed copy for each student OR access online:
 - Blueprint: <http://www.loc.gov/pictures/item/ny1234.sheet.00001a/>
 - Song sheet: <http://www.loc.gov/item/sm1883.15952/>
 - Newspaper article (first on page): <http://chroniclingamerica.loc.gov/lccn/sn83030272/1883-05-24/ed-1/seq-2.pdf>
 - Internet/computer access
 - Video: <http://www.history.com/topics/brooklyn-bridge>
 - Historic American Buildings Survey (HABS) and the Historic American Engineering Record (HAER) collections: <http://www.loc.gov/pictures/collection/hh/>
 - Word cloud generating software (See list at <http://www.edudemic.com/word-cloud-generators/>)
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PROCEDURE

1. (Connect) The Brooklyn Bridge was a marvel in technology in when it was constructed in the latter part of the 19th Century. Have students watch this video as an introduction to this marvel: <http://www.history.com/topics/brooklyn-bridge>.
2. Encourage students to note the technological advancements illustrated by this bridge while watching the video.
3. Hand out individual copies of this blueprint of the [Brooklyn Bridge](#).
4. Ask students to circle and label the technological advancements featured in this bridge that were highlighted in the video.
5. (Wonder) Ask students to think of an example of a new technology that maybe you like but your friends, parents, or grandparents are opposed to.
6. (Reflect) Lead a short discussion.

Considering how individual perceptions about emerging technologies vary, imagine how this new technology of the Brooklyn Bridge might have been greeted by the people of the time.

Were people afraid to use it?

Did they see it as a waste of money?

Was it a welcome breakthrough that made their daily lives easier?

7. (Investigate) Divide the class into small groups of 3 to 5. Provide each student with a printed or digital copy of the Library of Congress Analysis tools to record data: <http://www.loc.gov/teachers/primary-source-analysis-tool/>
 - a) Have half of the groups analyze this song sheet “The Highway in the Air”:
<http://www.loc.gov/item/sm1883.15952/>. Select the format on the analysis tool for “Sheet Music and Song Sheets”
 - b) Have the other half of the class analyze this newspaper account:
<http://chroniclingamerica.loc.gov/lccn/sn83030272/1883-05-24/ed-1/seq-2.pdf> (read the first article only about the Brooklyn Bridge). Select the format on the analysis tool for “Books and other Printed Text”.
8. (Construct) Discuss findings with the whole class. Record findings of the two pieces of text in a public place for all to see.

What point of view did the author have about the Brooklyn Bridge?
What evidence did you find that supported their point of view?
9. (Create) Have each group use the transcript of their source to create a word cloud (attached).
 - Ask each group to analyze their word cloud and compare this representation to the information recorded on their analysis tool.

Did the word cloud allow you to notice anything you overlooked before?
Did the word cloud skew information in any way?

Which source—the original or the word cloud—provides the more factual interpretation?

10. (Express) Have each group share their word cloud with the class and lead a discussion of their findings and conclude with the facts about their source. Discuss how data may have been skewed in the original source and in the Word Cloud. Cite evidence.
11. (Reflect) Reflect on the following questions about each resource. Record answers in front of classroom and/or as students to record information using the attached writing framework as a pre-writing exercise.
 - *Was your original source primary or secondary? How do you know?*
 - *What was learned about technology advancement and society from these sources?*
 - *Did either the word cloud or formal analysis better reveal evidence of the author's point of view?*
 - *What effect does society have on technology?*
 - *What effect does technology have on society? Provide modern examples.*
12. **Further investigation:**
 - Access the [Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscapes Survey](#).
 - Search this collection for a more modern bridge than the Brooklyn Bridge. It may be helpful to download the .TIF file and print it.
 - Examine the technical drawing of this newer bridge.

What is different than the Brooklyn Bridge? Similar?

What new technologies are represented?
 - Conduct research about the bridge you selected. Be sure to record notes about your findings, as well as citation information.
 - Project:

Develop a poster, pamphlet, or other material in support of governmental financing of the building of the bridge. Be sure to highlight the technological advancements demonstrated and include technical facts and advantages to society that would convince a government to build this bridge. Be sure make the material engaging and persuasive and include images of your bridge.

Evaluation

Assign students to use the evidence gathered from the sources and investigations to write essays describing their conclusions about how technology impacts society, citing evidence from the sources.

Highway in the Air (transcript)

<http://www.loc.gov/item/sm1883.15952/>

At the union of the cities by the highway by the Highway in the air, I met my pretty witty little girl, whose roguish eyes were dancing in a way to banish care; And set a fellow's brain into a whirl. Good ev'ning Cousin Brooklyn, I said with laughing eye; Good ev'ning, she answered with a tender little sigh; We strolled along the pathway, beneath the twinkling stars, and agreed to meet again when we parted on the cars.

Oh, the pretty piggy wiggie, the saucy laughing nymph, that I met when I had thought no care. I certainly shall win her, and invite you all to come to a wedding on the highway in the air.

I meet her now each evening, on the Highway in the air, midway between the grand and lofty tow'rs, and kiss her and caress her, and stroke her glossy hair, And long to lead her off to sunny bowers...but she is fascinated with the panoramic scenes, and tells me so provokingly, as on my arm she leans, when the cities are united, in interest and love, Our vow of constancy may be registered above.

Oh, the pretty piggy wiggie, the saucy laughing nymph, that I met when I had thought no care. I certainly shall win her, and invite you all to come to a wedding on the highway in the air.

I, firmly hope and trust that the highway in the air, will unite the two cities by the sea, in interests and affection, and that the wedded pair, will give a loving Brooklyn Bride to me. And that when our pretty first born is in its cradle curled, the great town will be the metropolis of the world; that the union of the cities by the highway in the air will end 'fore many years have passed with a wedding firm and fair.

Oh, the pretty piggy wiggie, the saucy laughing nymph, that I met when I had thought no care. I certainly shall win her, and invite you all to come to a wedding on the highway in the air.

The Brooklyn Bridge (newspaper article) Transcript:

<http://chroniclingamerica.loc.gov/lccn/sn83030272/1883-05-24/ed-1/seq-2.pdf>

On the 3d of January, 1870, the work of preparing for the foundation of the tower in Brooklyn was begun: and the stone tablet close to the top of that mighty pile bears the date 1875. A similar tablet is on the face of the New York pier bears the same date, although it is not finished and ready for the cable until a year later. A person who never had built such a bridge, would naturally suppose that the cables, made up of thousands of fine steel wires, would be put together and then hoisted to their proper places on top of the towers. But this is not the way. On Aug. 14, 1876, the end of a small wire was fastened to a scow on the one side of the river, and carried across to the other side, where it was hauled up aloft so that it cleared the masts of ships; and then other wires and ropes were passed back and forth by means of the first until a footway was built, and the machines made ready to stretch the cable wires across. And so the great cables grow in the air until they reached their present size. Then from the iron roadways were fastened to them, two carriage ways, two railroad tracks, and a footpath; and to-day, a little more than thirteen years from the time of its beginning, Mayor Low will enter the bridge from the Brooklyn end with a crowd of his fellow citizens, and wait at the Brooklyn station to receive the mayor of New York, who will come across with a crowd of his fellow citizens, including the President of the United States.

This distinguished party will be wise if they walk across on the raised footway in the centre. They should not walk very fast, for the grade is too steep for the ponderous form of President ARTHUR to be hurried much beyond the meditative step of the fisherman, if he is to arrive at the Brooklyn side with proper dignity. A gentle gait will also be better adapted to the conversation which will doubtless be carried on between Mayor EDSON and the President. The Mayor will

naturally do most of the talking, as he is more intimately associated with the many interesting objects which will rise into prominent view from such a height as the bridge. He can point out the tall tower of the Tribune, whose roof is higher than the President can get on the bridge, unless he should ascend to the top of one of the piers. Gen. ARTHUR must not forget, however, that near to the Tribune is the unpretentious office of THE SUN, which has the same disposition to do justice to him as to every other man. About the only novel object that the President can call the Mayor's attention to, will be a handsome steam yacht which was built for his own use by Mr. HENRY N. SMITH of Wall street, the owner of Goldsmith Maid. This yacht was sold by Mr. SMITH to the Government, and has anally come into Gen. ARTHUR'S hands as the Republican President, to be used to go fishing or sightseeing, or wherever he pleases. She will lie near the bridge with other vessels of the United States and help them to swell the thunder from their guns in honor of the occasion. Then, after the party have reached Brooklyn, the President will have a chance to hear the presentation speech by Mr. WILLIAM C. KINGSLEY and enjoy the eloquence of the addresses by Mayor LOW, Mayor EDSON, Dr. STORRS, and the hon. ABRAM S. HEWITT, Orators of the Day.

We have no means of knowing beforehand how these gentlemen will regard the bridge. Perhaps, after the manner of our foreign Consuls when courtesies are offered them in other countries, the two Mayors may congratulate each other and the citizens of both New York and Brooklyn upon the "prospective strengthening of the already cordial relations" between the two enormous cities, and the "probability of a closer intimacy between the counties of Kings and New York"-considerations that are commonplace enough. But as for Dr. Storrs and Mr. Hewitt, their

speeches are sure to be animated, learned, and philosophical, doing full justice to the importance of the occasion.

In regard to the main question, there are various ways of looking at it. The bridge will doubtless be a great convenience to the inhabitants of both cities. Thousands of vehicles will cross it on the wagon drives, and many more thousands of persons will walk across or be carried over in cars, a few for the novelty of the thing and to view the great stretch of country, with its countless and surprisingly diversified features of interest, and to see more closely the imposing arches of the piers and the majestic sweep of the cables up one side and down another; but the great mass of people will cross because they have something to do on the other side. It is hardly probable that the interchange of business between the cities will be immediately increased by the bridge. The present traffic has been accommodated by ferryboats, and the bridge will scarcely improve the facility for the crossing of teams to such a degree that a much greater quantity of goods will at once be sent from Brooklyn to New York or New York to Brooklyn. Possibly some people doing business in the lower part of New York, but have seriously objected to crossing twice a day in the ferryboats that they have lived in inferior accommodations in Harlem, may now go live in Brooklyn; but the number is not likely to be large. We think therefore that the bridge is not destined to have any startling immediate effect on business relations of the two cities. Great causes act gradually.

But will its effect be different on social intercourse of the present generation with their Brooklyn neighbors? Will it materially lessen the almost impassable distance between us? This is somewhat doubtful. To the majority of New York people Brooklyn has always been a little further off than Philadelphia. New Yorkers generally have more acquaintance, and pay more frequent visits in Philadelphia than they do in Brooklyn. New Yorkers are more familiar with the pensive productions of GEORGE W. CHILDS, A.M. than they are with the columns

of the leading journals of Brooklyn. Probably no citizen of Manhattan Island who doesn't go to Long Island, ever sees a copy of the Eagle or the Union, or know the instruction or entertainment that can there be gathered. And while the lordly structure will excite the wonder and curiosity of every New Yorker, it will probably be a long time before it comes into such general use that the inhabitants of New York above Washington square will be seen any oftener on Brooklyn Heights than they have been formerly. But to the residents of Brooklyn great opportunities will now be opened. They can come over here and do their shopping and see the picture galleries; and there is no reason why Mayor EDSON, on behalf of the citizens of New York, should feel hesitation about assuring Mayor LOW, the representative of Brooklyn, of his distinguished consideration and that of the rest of mankind. And all the rest will come in due time.

But what a monument the bridge is! The long slope leading from the entrance past the anchorage, with the cables springing out of the iron structure up to the top of the piers, to be met again on the other side, where they descend to the roadbed, the grand Gothic arches over the passages through the towers, may well strike one with awe and admiration at the ability of man to pile up such an edifice. Whether one stands upon it or looks at from a distance, or passes underneath it, it presents the same air of majestic grandeur and indestructible solidity that must cause it to be ever counted among the most imposing buildings that have ever been raised. And when one thinks of the daily use of this vast structure will be to thousands of people, it assumes a character which causes it to stand out distinct from all other works of equal magnitude. May the bridge last forever, and reflect eternal honor on its builders!

Writing Frame

<u>Key Topic</u>	
Resource Citation:	Resource Citation:
Main Idea	Main Idea
Essential Details	Essential Details

What questions remain to be researched?