

Grade: 6-8

Subjects: Career and Technical Education—
Technology Engineering

Time Required: 2 Class periods (50-60 minutes)

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OVERVIEW

In this lesson students will research and discuss the telephone, its origin, its innovations, its advantages and disadvantages, and how it has shaped today's society. Students will explore the design process of Alexander Graham Bell and will construct a timeline of the development and innovations of the telephone. Finally students will brainstorm questions regarding what life would be like without cell phones or telephones and what they believe might be the future of the telephone.

UNDERSTANDING GOALS

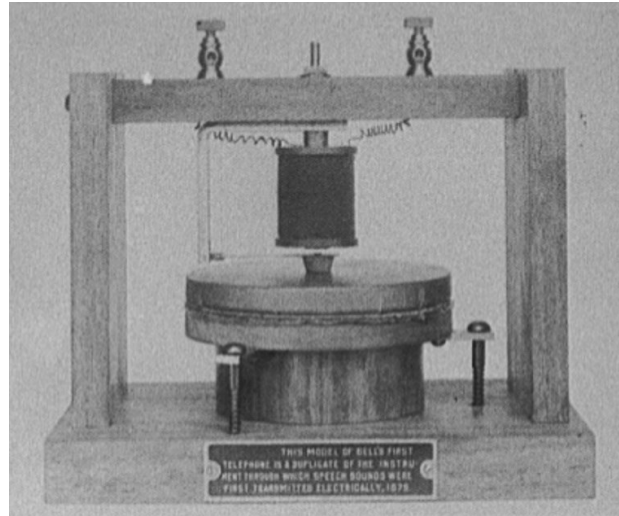
Students will understand the principles of telephone communication, its impact on society, and how the telephone has changed over time.

OBJECTIVES

After completion of this lesson, the student will know the origins and uses of the telephone in society, be able to analyze primary source images of the telephone, investigate how a telephone works, make a timeline of telephones through the past century, and understand how this invention relates to future innovations in telecommunications.

INVESTIGATIVE QUESTIONS

How has the invention of the telephone changed society? And how have telephone innovations impacted society over time?



[\[Model of Bell's telephone\]](#) [between 1915 and 1925]

CURRICULUM STANDARDS

Career and Technical Education

6th grade: Exploring Technology

4.3 Utilize computer technology to access and retrieve data.

7th grade: Inventions and Innovations

4.1 Identify one or two major innovations or inventions for each category of the design world.

6.1 Select an invention and innovation and discuss how it has impacted society.

8th grade: Technological Systems

4.1 Understand how technological systems work.

5.3 Explain how to take an invention and innovate this product to meet the current trends.

8.1 Select a common activity that requires the use of a technological system and predict how systems may change in the future with regard to trends.

8.2 Explain how the developmental trends of specific technological systems have changed over time.

RESOURCES

Primary Sources from the Library of Congress:

- Alexander Graham Bell's design sketch of the telephone, ca. 1876. [http://memory.loc.gov/cgi-bin/query/r?ammem/mcc:@field\(DOCID+@lit\(mcc/004\)\)](http://memory.loc.gov/cgi-bin/query/r?ammem/mcc:@field(DOCID+@lit(mcc/004)))
- Model of Bell's Telephone <http://www.loc.gov/pictures/item/det1994022913/PP/>
- Prints and Photographs Online Catalog <http://www.loc.gov/pictures>

Other Resources:

- How the Telephone Works <http://communication.howstuffworks.com/telephone.htm>
- How the Telephones Works <http://www.connected-earth.com/learningresources/Howitworks/Telephone/Howthetelephoneworks/index.htm>
- How to Save & Print http://library.mtsu.edu/tps/tools/How_to_Save_&_Print.pdf

PROCEDURE

Day One

Step 1 As a class discuss the following questions:

- How do students communicate with their friends and families? What about their teachers?
- What kinds of technology do they use most when communicating?

Once students have had a chance to discuss their answers, ask them:

- How long has the telephone been around and who invented it?

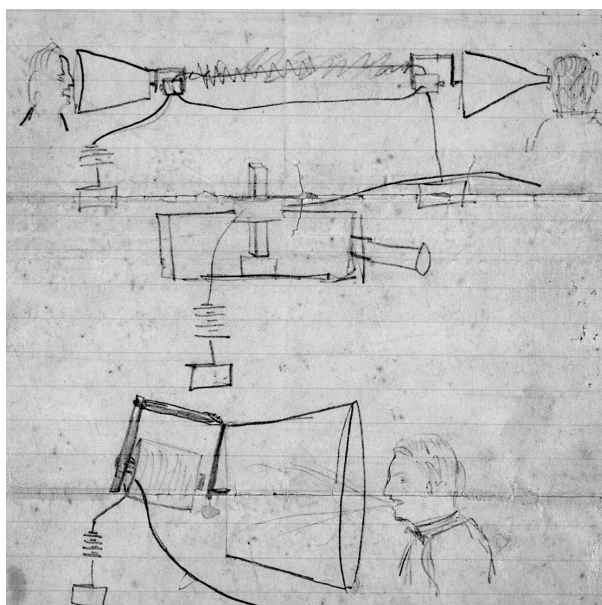
Explain that in this lesson, students will investigate the inventions and innovations of the telephone.

Step 2 Students should use their powers of observation and curiosity, to complete the Picture Analysis Worksheet (p. 4) using the Alexander Graham Bell's design sketch of the telephone located at <http://memory.loc.gov/mss/mcc/004/0001.jpg>.

This could be done as a whole class, using the overhead projector to enlarge the image, or in pairs at individual computer stations. **Do not tell them that this is a sketch of the first telephone.**

MATERIALS

- Computers with access to the Internet
- MS Word Program
- (Optional) Hard copies of Library of Congress images
- Handouts (included with lesson plan):
 - Picture Analysis Worksheet (p. 4)
 - Bell's Telephone Worksheet (p. 5)
 - Telephone Timeline Worksheet (p. 6)
 - What's Next Worksheet (p. 7)



[Alexander Graham Bell's design sketch of the telephone, ca. 1876.](http://memory.loc.gov/mss/mcc/004/0001.jpg)

PROCEDURE (cont.)

- Step 3** Have students discuss what they recorded on their Picture Analysis Worksheets with the whole class. Start with the first question, “What do you observe in this sketch?” Then move to the second, “What do you think this is a sketch of?” and “What questions do you have about this sketch?” After they have discussed their questions, tell them that this is the first sketch of the telephone made by Alexander Graham Bell and for the next few minutes, they will investigate his first telephone. Now have them answer the last question.
- Step 4** Have students complete the Bell’s Telephone Worksheet (p. 5) using the biographical information of “Alexander Graham Bell’s design sketch of the telephone” at [http://memory.loc.gov/cgi-bin/query/r?ammem/mcc:@field\(DOCID+@lit\(mcc/004\)\)](http://memory.loc.gov/cgi-bin/query/r?ammem/mcc:@field(DOCID+@lit(mcc/004))), and the image of the “Model of Bell’s Telephone” at <http://www.loc.gov/pictures/item/det1994022913/PP/> .
- Step 5** Discuss the responses that the students put on their worksheet. The activities on “How the Telephones Works,” located at <http://www.connected-earth.com/learningresources/Howitworks/Telephone/Howthetelephoneworks/index.htm>, can either be viewed from the computer stations or as a whole class.

Day Two

- Step 6** Using the Timeline Worksheet (p. 6), students, working individually or in pairs, will construct a timeline of telephone communication over the past 135 years using images from the Library of Congress Prints and Photographs Online Catalog. Follow instructions on the worksheet. After the students have completed their timelines, have them present them to the class and discuss what they found regarding the differing styles, dates of production, and other relevant information. If possible, put each student’s timeline on the overhead projector for the class to get a better view.
- Step 7** Close the lesson with a review of the invention of the telephone, how a basic telephone operates, and principles in telephone communication. Using the What’s Next? Worksheet (p. 7) , have students explore what they think the future of telephone communications will be. This worksheet can be completed individually or in pairs. Allow students time to share their responses.

EVALUATION

This lesson will be evaluated based on:

- Class participation (20pts)
- Completion of the Picture Analysis (20pts)
- Correct completion of the Bell’s Telephone Worksheet (20pts)
- Completion of Timeline on MS Word Document (20)
- Completion of the What’s Next Worksheet (20pts)

EXTENSION

Students can build a telephone network system. Use page five of the “How Telephones Work” article as reference:

- <http://communication.howstuffworks.com/telephone4.htm>

PICTURE ANALYSIS WORKSHEET

Name: _____

Period: _____ Grade: _____

Instructions:

Go to <http://memory.loc.gov/mss/mcc/004/0001.jpg> and answer the questions below.

1. What do you observe in the sketch?

2. What do you think this is a sketch of?

3. What questions do you have about the sketch?

4. What do you already know about the object in the sketch?

BELL'S TELEPHONE WORKSHEET

Name: _____

Period: _____ Grade: _____

Instructions:

Answer the following questions.

1. Go to: [http://memory.loc.gov/cgi-bin/query/r?ammem/mcc:@field\(DOCID+@lit\(mcc/004\)\)](http://memory.loc.gov/cgi-bin/query/r?ammem/mcc:@field(DOCID+@lit(mcc/004)))

Read the passage and answer these questions:

- a. What is this sketch of? _____
- b. Who drew the sketch? _____
- c. When was it drawn? _____
- d. What does the inscription at the top of the page say?

- e. From the middle of the drawing, briefly explain how this telephone works.

2. Go to: <http://www.loc.gov/pictures/item/det1994022913/PP/>. Compare and contrast this photographed telephone apparatus with the third drawing on Bell's sketch. What is the same? What is different?

3. Go to <http://www.connected-earth.com/learningresources/Howitworks/Telephone/Howthetelephoneworks/index.htm>. Read the introduction to "How the Telephones Works," then scroll down and work through the activities. Fill in the blanks:

_____ are transformed into _____ by vibrating a _____ and _____ that complete an electrical circuit in the microphone.

The speaker, or receiver, contains an _____ that creates a _____ from the electrical current, which vibrates a _____ creating sound waves.

TIMELINE WORKSHEET

Name: _____

Period: _____ Grade: _____

Instructions:

1. Go to <http://www.loc.gov/pictures>.
2. In the search box, type “telephone” and click “Go.”
3. Above your search results, locate the center box next to “Larger image available anywhere.” Click that box.
4. On the right side, there is a “View” selection. Click on “Gallery.”
5. Scroll through the pictures and select at least 6 different images of telephones from your search results. Click on the title below the image to get to the bibliographic page for the item.
6. Make a file in My Documents on your computer to save your images into.
7. Go to http://library.mtsu.edu/tps/tools/How_to_Save_&_Print.pdf and follow the steps for copying and saving images.
8. Open a MS Word document and title it “Telephone Timeline.” Put your name and today’s date at the top.
9. Insert images into your document and write a brief description including the style of the telephone, the date or approximate date of production, and any other relevant information. Make sure that your earliest picture is first and newest picture is last.
10. Save your work in your school folder and then print your timeline.

WHAT'S NEXT? WORKSHEET

Name: _____

Period: _____ Grade: _____

Instructions:

Answer the following questions. Be prepared to share your ideas with the class.

1. How would your life be different if the cell phone had never been developed?

2. How would your life be different if the telephone had never been invented? How would you communicate?

3. What do you think may be the next phase in telephone communication development?
