Second Grade

# DISCOVER AMERICA

## Course 19 - Teacher Guide

# Morse's Telegraph and Edison's Electric Light

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Second Grade

# Teacher Guide

## Key Themes

- Creative Liberty
- Innovation
- Experimentation to Improve Quality of Life
- Perseverance
- Community

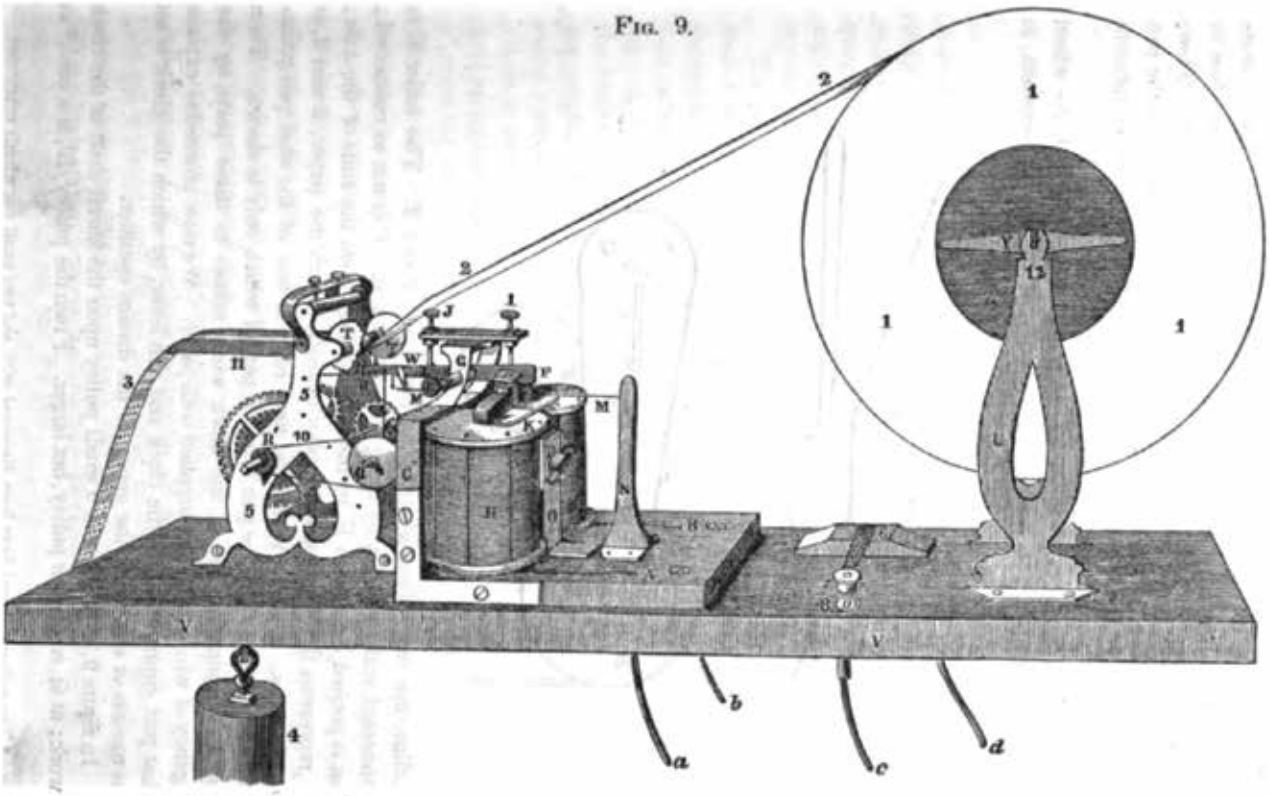
## Core Values

- Community
- Life
- Faith
- Liberty

# Learning Objectives

**Students will be able to:**

- Define perfecting.
- Identify the importance and impact of communication.
- Evaluate the importance of enhancing or upgrading existing items.
- List two scientific advancements that influenced life over the centuries.



Morse & Edison - Second Grade

# Key Terms

| | |
|---|---|
| 01 | **entrepreneur:** someone who decides to create or run a business. |
| 02 | **filament:** the part of a lightbulb that lights up when an electrical current heats it. |
| 03 | **Morse code:** a communication language that uses a system of dots and dashes to represent numbers and letters. |
| 04 | **patent:** an exclusive right given to an inventor to prevent others from making or selling their invention for a certain period of time. |
| 05 | **telegraph:** a device that uses wire to transmit messages over long distances. |
| 06 | **transmit:** to send. |
| 07 | **vibration:** the rapid back and forth movement of an object. |

# Morse & Edison - Second Grade

# Introduction

**TELL** Students

This morning, did you wake up and brush your teeth in the dark? Many of you may wake up when your parents turn on the light in your bedroom. Turning on the light is as easy as flipping a switch. Many of us do not even realize how valuable light is until we no longer have it!

**ASK** Students

Have you ever been at school or at home when the power went out and you had no electricity? What did your parents or teachers do to make sure you could see?

**TELL** Students

Turn off the lights. Write a note on the board and ask students to read the note. Guide them to understand that light is important and allows us to do things throughout the day in a safe manner.

**ASK** Students

A long time ago, people did not have electricity. They had to use other methods to see. Most often, while working on schoolwork or writing a letter, a gas lantern or candle was needed to see what you were doing. This could be dangerous if you accidentally left the candle burning too long or if it tipped over. Today we are going to learn about a man named Thomas Edison. He improved the light bulb so that we can easily have light in our homes and schools today. Show students a light bulb.

**ASK** Students

How does a light bulb work?
What problem did the light bulb solve?

**WATCH**

Star Spangled Adventures Cartoon Ep. 19: Thomas Edison

# Morse & Edison - Second Grade

# Lesson Guide

## **ASK** Students

What is a filament? Why does a light bulb work? How did Thomas Edison persevere, or overcome, when things were difficult?

## **TELL** Students

Though he received little formal education, Edison became one of history's most well-known and successful inventors, patenting a record-setting 1,093 inventions throughout his life. (This is approximately equivalent to one patent every 11 days.)  One day in 1888, he wrote down 112 ideas!

## **ASK** Students

What is a patent? Why do you think Thomas Edison wrote down his ideas?

## **TELL** Students

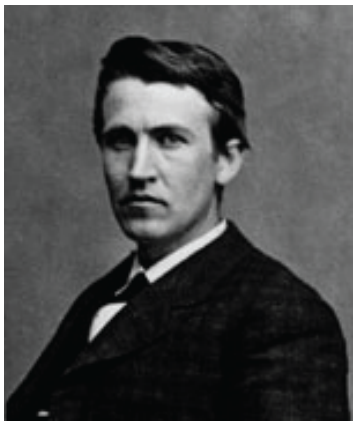
Thomas Edison was born in 1847 and had a sense of curiosity from a young age. When he was 13, he began selling snacks to railroad passengers, selling copies of the Detroit Free Press, and printing his newspaper while on the moving train! His paper grew and sold 400 copies per week. As a young boy, Edison was both an inventor and an entrepreneur. An entrepreneur is someone who decides to create or run a business. But what set him apart was his approach to invention. He didn't try to find a new problem to solve. Instead, he looked at what solutions had already been created and found ways to improve them. Edison referred to this as 'perfecting' rather than inventing. He took things that were already made and worked to make them better or less expensive.

## **ASK** Students

What is "perfecting?"

## **TELL** Students

In 1875, Edison built Menlo Park, an "Invention Factory" with a two-story laboratory conducting chemistry experiments on the top floor and a machine shop on the lower level. The facility was the first research and development facility. It was at Menlo Park that Edison and his team



*Thomas Edison*

# Lesson Guide

(known as "muckers") perfected the incandescent light bulb (incandescent is a fancy way of saying that something lights up when it's heated). In the 1870s, many homes were lit with gas lamps – which smelled terrible. A few cities had unbearably bright lights. Many scientists tried to make incandescent lamps for decades – but they didn't stay lit long enough, were too expensive to make, or used too much energy. Edison and his muckers focused on experimenting with the filament, the part of a lightbulb that lights up when an electrical current heats it. They tried hundreds of materials. In October 1879, they used a carbon filament in a light bulb that could last for 14.5 hours. They used carbonized bamboo the following year, which burned for up to 1,200 hours!

*Menlo Park*

## **ASK** Students

What is Menlo Park? Why were gas lamps unpleasant?

## **TELL** Students

Let's think about another modern technology that is helpful. This is something most of your parents use everyday. It has a ring but no finger. It will never ask you a question. But, it needs an answer. Can you answer these riddles? Yes, I am talking about a telephone. Most of your parents have a cell phone that they use each day. If you want to talk to a family member that lives far away, you can easily use the phone to do so. Before cell phones, many people had a landline.

*Landline*

# Morse & Edison - Second Grade

# Lesson Guide

Before the landline was invented, people used a different method to communicate. The telegraph was used as a way to communicate a long time ago. But, the telegraph wasn't as fast or accessible as needed.

*telegraph*

An inventor named Samuel Morse made the telegraph easier and cheaper to use. A telegraph is a machine that sends sounds that represent letters and numbers to communicate with someone from a distance. Morse developed a code of dots (short sounds) and dashes (long sounds) to correlate with numbers and letters and called it Morse code.

## **ASK** Students

What is a telegraph?
What is Morse code?

## **WATCH**

Learn More with Liberty Video: Edison's Quadruplex Telegraph System (2nd Grade)

## **TELL** Students

Samuel Morse became interested in telegraphy after overhearing a conversation on a ship. At the time, telegraph machines used multiple wires (one used 26, and another model used 5). Morse thought he could get the number of wires down to just one. He improved the telegraph and developed Morse code. Eventually, operators could listen to the clicks and beeps and translate the coded messages. Printing marks on paper was no longer necessary. On May 24, 1844, the first official telegraph was sent by Samuel Morse.  The message was, "What hath God wrought!" a reference to Numbers 23:23 in the Bible.

# Morse & Edison – Second Grade

# Inventor Showcase

**Objective:** To introduce second graders to the inventions and contributions of Thomas Edison and Samuel Morse through a fun and interactive showcase.

**Materials Needed:**

1. Pictures of Thomas Edison and Samuel Morse.
2. Visual aids (images and diagrams of their inventions).
3. Simple props related to their inventions (e.g., a light bulb for Edison, a Morse code chart for Morse).
4. Whiteboard and markers.
5. Craft supplies (paper, markers, crayons, scissors, glue, etc.).
6. Small flashlights or LED lights (optional).

**Introduction:**

- Show pictures of Thomas Edison and Samuel Morse.
- Ask students what they have learned about their inventions. Write down their responses on the whiteboard.

*Thomas Edison's Invention:*

- Introduce Thomas Edison's most famous invention, the light bulb. Show a picture of a light bulb and ask students to explain how it works.
- Let students experiment with small flashlights or LED lights to understand the concept of light and electricity.
- Discuss the impact of the light bulb on society.

*Samuel Morse's Invention:*

- Introduce Samuel Morse and his invention, the telegraph, which uses Morse code. Show a picture of a telegraph machine and a Morse code chart.
- Explain the basics of Morse code and how it was used for communication in the past.
- Have a simple Morse code demonstration where you spell out a word using Morse code, and have students decode it together.

**Creative Activity:**

- Divide the class into two groups, one for Edison and one for Morse.
- Provide craft supplies and ask each group to create a poster or diorama that represents the inventor and their inventions.
- Encourage them to be creative and include drawings, captions, and any relevant props.
- Allow time for students to share their creations with the class.

**Closing Discussion:**

- Bring the class back together and have each group present their posters or dioramas.
- Ask students to discuss what they learned and share interesting facts about Edison and Morse.
- Conclude by emphasizing the importance of inventors and their contributions to society.

**Optional Extension Activity:**

- Organize a "Mini Invention Fair" where students create their own simple inventions or contraptions using household materials. This will help them understand the creative process of inventors like Edison and Morse.

Morse & Edison – Second Grade

# Bright Ideas Worksheet

## How can you improve something in your home?

**Before:** Draw a picture of the original object and write how it is used.

**After:** Draw a picture of the new, improved item. Explain how you improved the item.

**Why is it important to improve items that already exist?**

# Morse & Edison - Second Grade

# Resource List

National Council Standards for Social Studies

"The study of how people organize for the production, distribution, and consumption of goods and services."(NCSS, 1921)

"The study of people, places, and environments." (NCSS, 1921)

"The study of the past and its legacy." (NCSS, 1921)

"The study of relationships among science, technology, and society." (NCSS, 1921)

"The study of individual development and identity will help students to describe factors important to the development of personal identity." (NCSS, 1921)

https://www.pbs.org/wgbh/theymadeamerica/whomade/morse_hi.html

https://lemelson.mit.edu/resources/samuel-morse

https://www.nga.gov/collection/artist-info.1737.html

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https://history.house.gov/Exhibitions-and-Publications/Electronic-Technology/Telegraph/

https://lemelson.mit.edu/resources/samuel-morse

https://www.history.com/topics/inventions/telegraph

https://www.history.com/this-day-in-history/what-hath-god-wrought

https://lemelson.mit.edu/resources/samuel-morse

https://www.pbs.org/wgbh/theymadeamerica/whomade/morse_hi.html

https://www.history.com/topics/inventions/telegraph

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https://www.energy.gov/articles/history-light-bulb

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https://www.newyorker.com/magazine/2019/10/28/the-real-nature-of-thomas-edisons-genius

# Notes