

## Dashes and Dots: Morse Code and the Navy



**Grades:** 3-5 (mid-level)

**Time Frame:** 30-35 minutes (10 min introduction, 10-15 minute activity, 10 minute follow up)

### Materials Needed:

- Pens/Pencils
- Morse code sheets
- Flashlights
- Albacore: Morse code key, signal lamp

**Objectives:** Students will learn about Morse Code communication on submarines. In learning about Morse code as a method of communication, students will better understand technological advances and how engineering has historical influence. Students will participate in an activity where they must communicate via Morse Code, thus forcing them to ponder how the medium of communication impacts the effectiveness of a message, and how it can then also affect interactions on board submarines, from submarine to submarine and from submarine to shore.

### Connection to Curriculum Frameworks:

Maine

- Science and Engineering
  - 4-PS4-3 Generate and compare multiple solutions that use patterns to transfer information
  - MS-PS4-3 Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals

Massachusetts

- Social Studies
  - Guiding Principle 5: an effective history and social science curriculum integrates knowledge from many fields of study
    - Includes developments in science, technology, and mathematics
- Science and Technology/Engineering
  - 4-PS4-3. Develop and compare multiple ways to transfer information through encoding, sending, receiving, and decoding a pattern.

- 5.3-5-ETS3-1. Use informational text to provide examples of improvements to existing technologies (innovations) and the development of new technologies (inventions). Recognize that technology is any modification of the natural or designed world done to fulfill human needs or wants
- 7.MS-ETS3-1. Explain the function of a communication system and the role of its components, including a source, encoder, transmitter, receiver, decoder, and storage
- 7.MS-ETS3-2. Compare the benefits and drawbacks of different communication systems.
- 7.MS-ETS3-5. Use the concept of systems engineering to model inputs, processes, outputs, and feedback among components of a transportation, structural, or communication system.

#### New Hampshire

- Social Science
  - Theme G: Science, Technology, and Society
    - Goals:
      - Time Efficiency
      - Impact of New Technology
    - Core Questions
      - What are the real costs of new technologies?
      - How can we manage science and technology to provide the greatest benefit?
      - Who benefits from scientific and technological innovations?
  - Essential Skills
    - Differentiating past, present and future and change over time
- Science
  - 4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.
  - MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals

**Classroom Setup:** Students will need a spot to shine the flashlight on, such as a desk, a whiteboard, or the ground. Set-up the classroom to accommodate a few different groups of students, with space in between. To social distance, clear a spot in the middle of the classroom and have students stand six feet apart and shine the flashlight at the floor in between them.

**Albacore Setup:** Table set up under a tent with flashlights, telephone, signal lamp, dry erase markers, laminated Morse code sheets, wipes or spray and paper towels for cleaning the board, and hand sanitizer

#### Introduction and Diagnostic Assessment:

- Ask the students to list some of the ways they communicate with their family and friends
- Ask if any of them know how countries, boats, etc. communicated with each other before the methods they mentioned existed.
- Morse code is a system of communication where dots and dashes are used to communicate letters and words. It was used before modern methods of

communication, such as telephones or text messages, existed, and it is still used in situations where it is difficult to transmit written or spoken messages.

- Explain how Morse code works:
  - Dots and dashes are used to spell out words.
  - A certain pattern of dots or dashes corresponds to each letter.
  - When using a light, longer flashes are dashes and shorter flashes are dots.
- Show Object I.D: 2019.135.0001 - Signal lamp
  - This is the kind of signal lamp that was used for Morse code messages
- Show Morse Code Key
  - The Albacore also used Morse code radio messages because the code could cut through the static of the radio
- Now you are going to have a chance to try out communicating via Morse code!

#### **Procedure and Formative Assessment:**

- Give each student a flashlight and a Morse Code worksheet.
- The worksheets will have a simple, submarine related word with the Morse code next to each letter
- Have the students practice signaling the words to each other, noting what's challenging or satisfying about the process.

#### **Conclusion and Summative Assessment:**

- Ask the students what they thought about messaging in Morse code. What was difficult or frustrating about it? How is it different from how we communicate nowadays?
- Have the students put technological progress in context: How does communicating via telephone or with written messages rather than Morse code change the nature of communication? How might this affect wars?
- What could some drawbacks of new methods of communication be?

## Morse Code Worksheet 1:

A: -

H:

O: - - -

Y: - - -

## Morse Code Worksheet 2:

B: -

O: - - -

A: -

T: -

## Morse Code Worksheet 3:

S:

U: -

B: -

## Morse Code Worksheet 4:

W: - -

A: -

V: -

E:

## **Image Sources:**

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Flashlight: <https://commons.wikimedia.org/wiki/File:Flashlight.svg>

Morse code worksheets: created by author