



ARISS Education

Ada Lace and Ham Radio Exploration Final Lesson

Objectives:

Students will:

- Explore key themes from the book and analyze the role of ham radio in communication.
- Identify problems and solutions within the story through a plot diagram activity.
- Demonstrate comprehension through formal written assessments.
- Engage with a local ham radio expert to learn about real-world applications.
- Investigate the Civil Air Patrol STEM Kit Program.
- Develop writing skills through reflective, informational, explanatory, and opinion-based writing prompts.

Suggested Grade Levels:

3rd-8th Grade

Subject Areas:

- Science (Earth & Space, Physics, Engineering)
- Technology
- Reading and Literacy
- History

Time Allotment:

2-3 class periods (45-60 minutes each)

Next Generation Science Standards:

- **3-PS2-4:** Define a simple design problem that can be solved by applying scientific ideas.
- **MS-ETS1-1:** Define the criteria and constraints of a design problem to ensure a successful solution.
- **MS-PS4-3:** Integrate qualitative scientific and technical information to support the claim that digitized signals are a reliable way to encode and transmit information.

Background Information:

- Ham radio, or amateur radio, is an essential communication tool used in emergencies, scientific exploration, and global networking. It allows individuals to communicate wirelessly using radio frequencies. Ham radio is often used by astronauts aboard the International Space Station (ISS) to connect with students worldwide. This lesson integrates literacy and STEM to explore its significance in communication technology.
- **Resources:**
 - ARRL: www.arrl.org
 - NASA ARISS Program: www.ariss.org
 - Civil Air Patrol STEM Kits: www.gocivilairpatrol.com



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Vocabulary:

- **Amateur Radio (Ham Radio):** A licensed radio communication system for non-commercial use.
- **Call Sign:** A unique identifier assigned to a ham radio operator.
- **Frequency:** The rate at which a radio wave oscillates.
- **Morse Code:** A system of dots and dashes used in early radio communication.
- **Transceiver:** A device that both transmits and receives radio signals.

Materials:

- Copies of *Ada Lace, Take Me to Your Leader*
- Plot diagram worksheets
- Computers/tablets for research
- Writing journals
- AR Quiz #195904
- Civil Air Patrol STEM Kit (optional)

Lesson Procedures:

1. **Introduction:** Review key themes from the book and discuss the importance of ham radio in communication.
2. **Plot Diagram Activity:** Have students create a brief plot diagram examining the problems and solutions in the story.
3. **Formal Written Assessment** (Part 1 evaluates ELA content & Part 2 evaluates science concepts).
4. **Accelerated Reading Quiz:** Administer AR Quiz #195904 to assess comprehension.
5. **[End of Unit Test](#)**

Differentiated Instruction:

- a. **Visual Learners:** Videos and diagrams.
- b. **Auditory Learners:** Listening to ham radio transmissions and astronaut research presentations.
- c. **Kinesthetic Learners:** Hands-on activities related to electrolysis and wave demonstrations.
- d. **ESL Students:** Provide vocabulary lists with translations and visual aids.
- e. **At-risk Students:** Assign peer partners and provide structured guidance.
- f. **Advanced Learners:** Challenge students to design and present a communication device.

Extensions:

- **Guest Speaker:** Invite a local ham radio club member to share real-world applications of ham radio.
- **STEM Kit Exploration:** Continued engagement with the Civil Air Patrol STEM Kit(s).
- **Writing Prompts:** If you did not elect to do so in the prior lesson, you may utilize those prompts during the wrap-up of your unit.