Standards-aligned Educator Guide
BEATRICE AND THE NIGHTINGALE

The book

Age Range: 6 to 9 years
Grade Level: Grades 1 to 4
Publisher: Margaret Quinlin Books/Peachtree
ISBN: 978-1-68263-727-2

Beatrice Harrison was a toddler when she first heard a cello. Its silky voice touched her heart. “Baba play tello!” she begged. As Beatrice grew, she learned piano, then violin. At last, at age eight, she received her first cello. She practiced every day and dreamed of sharing the cello’s music with the world.

At age seventeen, Beatrice was the youngest competitor ever and the first cellist to win the biggest music prize in Germany. For the next few decades, her fame grew as she continued to share her music with fans in concert halls around the world. When she was at home in England, Beatrice often practiced in the garden. One night, she heard a nightingale singing along with her cello. Thrilled, Beatrice played on, and the nightingale continued to accompany her. She longed to find a way for others to experience this wondrous duet. But how?

With luminous illustrations by Isabelle Follath, this heartwarming story of a young girl’s passion and musical gift shows how, with the help of a marvelous new invention, she found a way to share this miracle with the world.

“This wonderfully whimsical account, based on Beatrice’s actual life, is a gentle gem of a story…a delightful introduction to a lesser-known life, and a welcome reminder of the wonder that exists in the natural world.” —Booklist

The author

Patricia Newman writes award-winning nonfiction that is part biography, part science adventure. As a Robert F. Sibert Honor recipient, she empowers us to find our own connections to nature and encourages us to use our imaginations to make the world a better place. Patricia’s love of nature and her own efforts to play piano seemed the ideal background for this story about the intersection between nature, music, and technology. Other distinguished titles include *Sharks Unhooked; Giant Rays of Hope; A River’s Gifts*; *Planet Ocean*; *Eavesdropping on Elephants*; *Sea Otter Heroes*; and *Plastic, Ahoy!* Visit her at patriciamnewman.com.

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inspiring action, not anxiety

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What's in this guide:

LESSON SERIES: SOUNDS OF NATURE WITH *BEATRICE AND THE NIGHTINGALE*

A four-part interdisciplinary lesson series targeting grades 4 to 6

NGSS and Common Core Focus Standards:

- **4-PS4-1**: Develop a model of waves to describe patterns in terms of amplitude and wavelength.
- **4-PS4-3**: Generate and compare multiple solutions that use patterns to transfer information.
- **MS-PS4-1**: Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
- **ELA Integration: RI.4.1/RI.5.1:** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences.

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4-POINT RUBRIC: SOUNDS OF NATURE LESSON SERIES

CRITERIA	4-EXCELLENT	3-GOOD	2-NEEDS IMPROVEMENT	1-BEGINNING
Understanding of sound concepts	Shows a deep understanding of sound waves, frequency, and vibration.	Shows good understanding but misses some details.	Shows basic understanding with some errors or gaps.	Shows little or no understanding of sound concepts.
Use of scientific vocabulary	Uses many scientific terms correctly (e.g., amplitude, frequency, vibration).	Uses scientific terms but with minor errors or omissions.	Uses some scientific terms but inconsistently or incorrectly.	Rarely or never uses scientific vocabulary.
Creativity and engagement	Highly creative and engaging presentation that holds listener interest.	Creative and mostly engaging presentation.	Some creativity but presentation lacks engagement.	Little creativity or engagement in presentation.
Clear Communication	Clear, well-organized, and easy to understand.	Mostly clear and organized with minor issues.	n/a	n/a

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Beatrice and the Music of Nature

Curated by Maia Steward with a group of environmental educators

Subject
ELA, Science

For ages 10–12

Other subject links:
Music, History

Themes
Connection to Nature, Perseverance, Empathy

OBJECTIVES

Students will learn about Beatrice Harrison and identify the central ideas in the biography.

MATERIALS

- Excerpts from *Beatrice and the Nightingale*
- Audio clip of nightingale sounds and cello music
  - https://youtu.be/QPxT95WwIBM?si=fao5QOQ1N4XeZ7a4
  - https://youtu.be/RbQ0A5Ynmlg?si=xzX8rZ5coatl_SS1 from 0:00 to 0:49
- Graphic organizer: Timeline - see page 6

ENGAGE

- Activity: Start with an intriguing question or an audio clip of nightingale sounds. Ask students, "What do you think it means to connect with nature through music?"
- Graphic Organizer: Use a "Think-Pair-Share" graphic organizer where students jot down their initial thoughts and then discuss them with a partner.

EXPLORE

- Activity: Read Aloud & Discussion
  - Read *Beatrice and the Nightingale*.
- Prompt discussion with questions:
- "What inspired Beatrice to become a cellist?"
- "What made her duet with the nightingale so special?"
- Graphic Organizer: Create a Cause-and-Effect Chart. Students list events from the reading in one column and their effects in the next, helping them see how Beatrice's decisions shaped her life.

EXPLAIN

- Activity: Timeline Mapping
  - Students will organize the major events in Beatrice's life on a timeline.
  - Distribute the blank timeline graphic organizer. Students can fill in dates and significant events, illustrating the progression of her career and personal life.
- Discussion: Explain key concepts regarding the significance of her music and how it reflects her connection to nature.

ELABORATE

- Activity: Audio Exploration
  - Play audio clips of nightingale sounds and cello music.
  - After listening, students will record their observations in a Sound Observation Log, in which they can note the qualities of the sounds, their emotions, and any comparisons they can make.

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- Science Tie-In: Discuss sound as a form of energy. Use a simple diagram showing how sound waves travel from birds and instruments to humans, allowing for visual representation of sound energy.
- Additional Considerations:
  - Cultural Relevance: Encourage students to share any personal connections they have to music or nature, fostering a sense of belonging and relevance in the lesson.
  - Differentiation: Provide options for students to express their understanding. They could draw a scene from Beatrice's life, create a short poem about sound, or present their findings to the class.

EVALUATE

- Exit Ticket:
  - Students write one sentence answering the question: "What is one way Beatrice used sound to connect with the world?"
  - This can be done on a Reflection Card, which can be collected at the end of the lesson to gauge understanding.

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Timeline Worksheet: The Life of Beatrice Harrison

Instructions: Use this worksheet to organize important events from Beatrice's life as you read the book.

DATE	BEATRICE'S AGE	DESCRIPTION OF LIFE EVENT

Write three sentences explaining why these events were important.

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What is Sound, Really?

Curated by Maia Steward with a group of environmental educators

Subject
Science, Art

Other subject links:
Math, Language Arts

Themes
Exploration + Inquiry, Collaboration, Real-world Connections, Creativity + Expression

For ages 10–12

OBJECTIVES

- Explore the science of sound: how it travels, what it looks like as a wave, and how we perceive it.

MATERIALS

- Tuning forks
- Plastic cups and string for string phones
- Online wave simulations (optional)
- Rubber bands
- Science notebooks
- Sound Wave Mini Lab Recording Sheet (page 9)

ENGAGE

- Goal: Capture students' interest and activate prior knowledge about sound.
- Activity: Show a short, engaging video that illustrates different sounds and how they are produced (e.g., musical instruments, nature sounds). Follow this with a class discussion, asking students to share examples of sounds they enjoy and their thoughts on how sound travels.

EXPLORE

- Goal: Provide hands-on experiences to investigate sound through mini lab stations.
- Activity: Mini Lab Stations
  - Use the Sound Wave Mini Lab Recording Sheet provided.
  - Station 1: Tuning Fork in Water
    - Students strike a tuning fork and observe how vibrations create ripples in water. To enhance understanding, ask them to predict what will happen before they try it.
  - Station 2: String Phones
    - Students create their own string phones with materials provided (plastic cups and string) to explore how sound travels through different mediums. Encourage them to experiment with different lengths of string.
  - Station 3: Pitch and Volume with Rubber Bands
    - Students explore how changing the tension and thickness of rubber bands affects pitch and volume.

EXPLAIN

- Goal: Help students articulate their understanding of sound waves.
- Activity
  - Together, create a sound wave anchor chart on a whiteboard or poster. Include definitions, diagrams, and examples of key

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concepts like amplitude, frequency, and wavelength. Encourage students to contribute their observations from the lab stations.

ELABORATE

- Goal: Deepen understanding and apply knowledge creatively.
- Activity
  - Have students draw and label wave patterns in their science notebooks, focusing on amplitude and frequency.
  - Then, pose the scenario: "What would Beatrice and the bird's sound waves have looked like?"
  - Encourage creativity by allowing students to illustrate their ideas using colors and labels.

EVALUATE

- Goal: Assess student understanding and growth.
- Assessment Options
  - Option 1: Evaluate students' drawings and explanations of wave patterns, providing constructive feedback.
  - Option 2: Conduct a group gallery walk where students share their illustrations and explanations with classmates, fostering collaboration and feedback.
  - Option 3: Administer a quiz or worksheet that includes matching definitions with terms related to sound waves, allowing for varied formats (e.g., multiple choice, short answer).

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Sound Wave Mini Lab Recording Sheet

Instructions: Record your observations for each sound activity below.

DEVICE	WHAT DID YOU SEE?	WHAT DID YOU HEAR?
Tuning Fork		

DEVICE	HOW DID SOUND TRAVEL?	WHAT CHANGED WHEN YOU PULLED THE STRING TIGHT?
String Phone		

DEVICE	HOW DID PITCH AND VOLUME CHANGE WHEN YOU STRETCHED THE BANDS?
Rubber Bands	

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Nature's Musicians

Curated by Maia Steward with a group of environmental educators

Subject
Science, Music

Other subject links:
Language Arts

Themes
Nature + Environment, Art + Expression, Communication + Language

For ages 10–12

OBJECTIVES

- Compare natural vs. human-made sound sources and analyze how the nightingale mimicked music.

MATERIALS

- Audio of various bird calls (The Macaulay Library at Cornell University's Laboratory of Ornithology has a wonderful collection of bird sounds.)
- Venn Diagram worksheet (see pages 11 and 12)
- Text excerpts from *Beatrice and the Nightingale*

ENGAGE

- Bird Sound Identification Game:
  - Play audio clips of different bird sounds.
  - Students will guess which bird is making the sound.
  - Discuss their thoughts about the sounds and how they might relate to emotions or environments.

EXPLORE

- Text Analysis
  - Provide students with excerpts from the book discussing the nightingale and its musical abilities.
  - Ask students to highlight key phrases that indicate how the nightingale mimics music.

EXPLAIN

- Compare/Contrast Activity
  - Distribute Venn Diagram worksheets.
  - Students will fill out the diagram comparing the nightingale and a cello (or another human-made instrument) based on aspects like sound production, purpose, and emotional impact.
  - Facilitate a class discussion where students share their findings.

ELABORATE

- Creative Response Prompt
  - Students will write a short paragraph titled, "If you could play music with any animal, who would it be and why?"
  - Encourage students to think about the animal's sounds, their unique qualities, and how those sounds could create music.

EVALUATE

- Reflection
  - Have students share their creative responses with a partner or in small groups.
  - As a class, discuss the uniqueness of animal sounds and the similarities and differences they found between natural and human-made sounds.

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Bird vs. Cello: Comparison Chart

Instructions: Use the chart below to compare and contrast the sounds of the nightingale and the cello.

Nightingale	Both	Cello

Describe one similarity and one difference you found.

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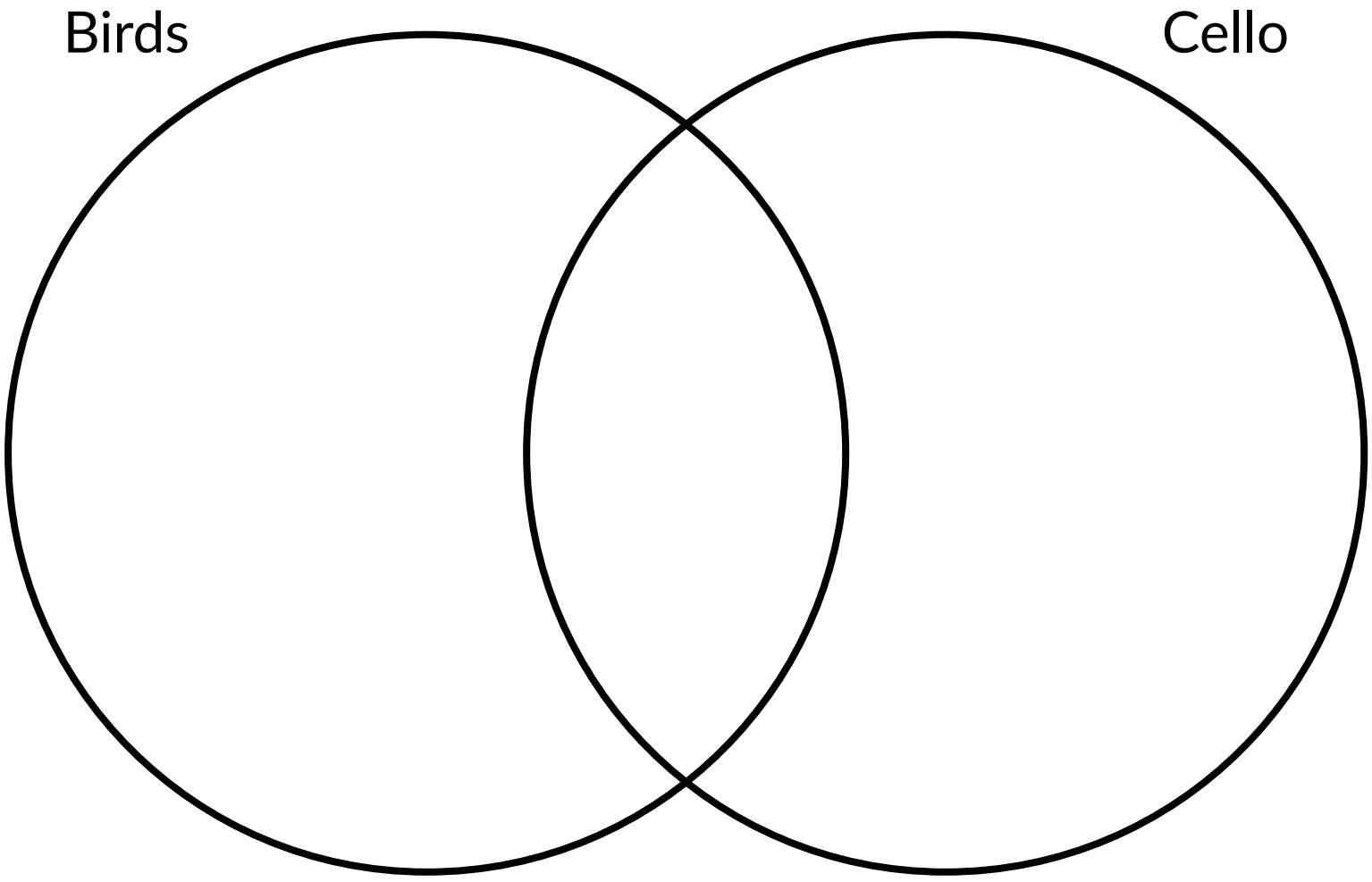
Bird vs. Cello: Comparison Chart - Venn Diagram

Instructions: Transfer the information on your chart to this Venn Diagram.



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Sound Through the Airwaves

Curated by Maia Steward with a group of environmental educators

Subject
Science, History

For ages 10–12

Other subject links:
Language Arts

Themes
Technology + Innovation, Nature, Communication

OBJECTIVES

- Understand how sound was transmitted through radio and why Beatrice's broadcast was groundbreaking.

MATERIALS

- Simple cup-and-string telegraph model or a basic circuit with a speaker
- Diagram of a radio transmission
- Short reading on early radio (adjusted for grade level)
- Audio recording device (optional for final project)
- Radio Script Template for students' Nature Sound Broadcast (page 15)

ENGAGE

- Introduction to Sound
  - Review the What is Sound Really? lesson in this guide.
  - Ask students to review what they know about sound and how it travels.
  - Review the concept of sound wave vibrations using results from the previous lesson.

EXPLORE

- Build a Model
  - Activity
    - Students will create a simple cup-and-string telegraph model or use a basic circuit with a speaker to demonstrate the transmission of sound.
  - Guided Questions
    - How does the sound travel through the string?
    - What happens when you speak into one cup?

EXPLAIN

- Case Study of Beatrice's Broadcast
  - Provide students with a short reading about Beatrice's broadcast and the technology of the time.
  - Activity
    - Map the journey of sound from the garden → microphone → airwaves → audience using a diagram.
    - Discuss the significance of her broadcast and how it impacted communication.

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ELABORATE

- Final Project
  - Activity
    - Students will write or record a short radio-style segment about a nature sound they love, incorporating vocabulary such as vibration, frequency, and volume.
    - Encourage creativity and connection to their personal experiences with nature.

EVALUATE

- Assessment and Reflection
  - Use a rubric to assess the final project based on:
    - Understanding of sound waves
    - Use of vocabulary (vibration, frequency, volume)
    - Creative connection to nature similar to Beatrice's approach.
    - Provide feedback on their projects and discuss what they learned about sound transmission and its historical context.

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Radio Script Template: Nature Sound Broadcast

Instructions: Write a short radio-style script about a nature sound you love. Use vivid words and facts!

Title of your broadcast:

Introduce yourself and your nature sound:

Describe the sound and what makes it special:

Tell a story or fun fact about the sound:

Invite listeners to enjoy nature sounds in their own lives:

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