



What is Lunch With A Scientist?

Lunch With A Scientist is a YouTube Video Series that provides students and educators an insider's glimpse into the lives of working STEM professionals and their research.

Search our full library and subscribe to our channel so you never miss an episode!

youtube.com/@headwatersscience

Thank you for using this FREE educational resource!
Please help us collect [survey data](#) for required reporting to our funders.

TEACHER'S GUIDE

Scientist/Researcher: Carly Batist

Talk Title: Listening to Learn: How We Can Use Sound to Conserve Wildlife

Watch: [Carly's talk](#)

About the Researcher:

Carly is a PhD Candidate in primatology at the City University of New York (CUNY)'s Graduate Center. Her dissertation research uses passive acoustic monitoring and machine learning to survey Critically Endangered black-and-white ruffed lemur populations in the southeastern rainforests of Madagascar. She is also the Science Outreach Coordinator at Rainforest Connection and Creator of the Conservation Tech Directory.

NEXT GENERATION SCIENCE STANDARDS:

MS-LS2-1: Ecosystems: Interactions, Energy, and Dynamics – Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-4: Ecosystems: Interactions, Energy, and Dynamics – Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

MS: Science and Engineering Practices, Developing and Using Models – Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs.



TEACHER'S GUIDE

FOOD FOR THOUGHT - Q&A

1. Why is sound important?

A: Sound is a crucial aspect of our everyday lives. From a human perspective, most of us communicate verbally but it's pretty hard to understand body language alone. This makes sound the primary source to communicate and decipher important messages.

2. What animals do you know who vocalize?

Examples might include: Howler Monkeys, Birds, Insects, Whales & Dolphins, etc.

3. Why do scientists record and listen to animal vocalizations/sounds?

A: It is an efficient way to survey and identify different animals in a specific area without needing to be directly there. Some locations are hard/dangerous to access or see at different times of day.

4. What is the only country Lemurs are found in?

A: Lemurs are native to Madagascar. There are 110 different types of Lemurs.

5. What type of species did Carly study and what was a unique feature of this particular lemur?

A: She studied the Black-and-White Ruffed Lemur. They are key seed dispersers and pollinators; communal infant rearing; they have litters of babies

6. Why did Carly study this specific lemur in Madagascar?

A: She used detections of lemur vocalizations to understand their distribution across the forest corridor in an area experiencing increased habitat loss due to deforestation.

7. What did they find about where the lemurs were located?

A: The Black-and-White lemurs were only found in the northern half of the forest corridor.

8. How much time goes into gathering data and publishing research?

Answers may vary but generally a scientist can spend months to years collecting data, a few months to analyze and writing the research paper, and it can take up to a year for a study to be accepted to a journal and published. You can highlight to students that research is often a long but rewarding process and great way to collaborate with other researchers and community stakeholders.

9. BONUS! What language is spoken in Madagascar and how do you say hello/goodbye?

-- Malagasy is the official language of Madagascar. Hello = Salama; Goodbye = Valoma



STUDENT RESEARCHER: SCIENTIFIC TERMINOLOGY

- **Acoustic Ecology:** sometimes called ecoacoustics or soundscape studies, is a discipline studying the relationship, mediated through sound, between human beings and their environment.
- **Acoustic Monitoring:** surveying and monitoring wildlife and environments using sound recorders.
- **Wildlife Conservation:** protecting our environment and the wildlife that lives in it. It includes looking after biodiversity and the health of the planet.
- **Spectrogram:** visual image of sound
- **Sound Pitch:** the quality of a sound (high or low) and depends on the speed of the vibrations
- **Vocalizations:** the act or process of producing sounds with the voice. Calls for communication (warnings, mating)
- **Madagascar:** Island off the East coast of the continent of Africa. It is the 4th largest island in the world.
- **Lemur:** a wet-nosed primate, similar to a monkey with thick fur and a long tail, that lives in Madagascar
- **Species:** a group of similar organisms that are able to reproduce.
- **Keystone Species:** organisms, usually animals, that play a crucial role in different habitats and have a huge effect on the environment around them. They may help control the population of other species, or perhaps help the growth of certain types of plants in an ecosystem.
- **Pollinator:** an important part of the life cycle of plants where insects, birds, bats, and the wind take pollen between flowering plants, which helps plants make seeds and reproduce.
- **Deforestation:** the clearing, or cutting down, of forests. The word is normally used to describe the actions of humans in removing forests from the planet, rather than destruction caused by such natural events as hurricanes.
- **Habitat Loss:** when plants or animals experience a change in their natural environment that means they cannot access food, water, or shelter as they normally would.



STUDENT RESEARCHER: FOOD FOR THOUGHT

Hello young researchers!

While watching Carly's talk please answer the following questions:

1. **Why is sound important?**
2. **What animals do you know who vocalize?**
3. **Why do scientists record and listen to animal vocalizations/sounds?**
4. **What is the only country Lemurs are found in?**
5. **What type of species did Carly study and what was a unique feature of this particular lemur?**
6. **Why did Carly study this specific lemur in Madagascar?**
7. **What did they find about where the lemurs were located?**
8. **How much time goes into gathering data and publishing research?**

BONUS! What language is spoken in Madagascar and how do you say hello/goodbye?



STUDENT RESEARCHER INVESTIGATION

Birding investigation adapted from Kris Irwin Ph.D. (Daniel B. Warnell School of Forestry and Natural Resources) and Project Learning Tree.

In her research, Carly Batist, used acoustic monitoring to survey and monitor wildlife and their environments using sound recorders. In this activity, you will use acoustic monitoring to observe and record animal sounds using a cell phone or other digital recorder. Using math and technology you will be able to identify what types and how many birds are in a specific area.

Investigate: How many unique bird species can you identify using only their song?

Task: Select an outdoor location that is easy and safe to access. This might be your backyard or a local park. Remain quiet for at least 15 minutes, listen for bird calls, and record the sounds using a cell phone or other digital recorder. Replay your recordings and try to identify the different bird species by their unique calls.

Integrating Technology Into Acoustic Monitoring: Birding by ear is a great skill, as one is much more likely to hear a bird than to see it. There are many apps that can help to identify birds. One example – Bird Song Hero – provides a visual display of a bird's song using a spectrogram. The Merlin Bird ID app uses three key observations, namely size, location, and coloration, for bird identification. Once you have identified a bird, check Bird-sounds.net to research your birds and listen to learn their call.

Integrating Math Into Acoustic Monitoring: Counting birds either by hearing or seeing them produces the same results: a bird is confirmed. Knowing the number of birds counted each year provides scientists a better understanding of the population and distribution of a species. Use observation data collected by The National Audubon Society to examine bird populations in your state. Follow the directions provided and construct your own spreadsheet for any bird. Create graphs for any period of time between 1906 and the present day. Try picking the year you were born and compare those results to the most recent data.

Additional Resources:

- [National Audubon Society](#)
- [BirdSounds.net](#)
- [Merlin Bird ID App](#)
- [Cornell Ornithology Lab](#)
- [Great Backyard Bird Count](#)