Young Sound Seekers

Young Sound Seekers offers a collection of listening activities that highlight the importance of natural and cultural soundscapes. Through guided lessons and discussions, they show how sound affects people, wildlife, and habitats.

The activities can stand alone or work together as part of a larger curriculum. They align with national education standards like Common Core (English and Math) and Florida's Next Generation Sunshine State Standards (Science and Skills). Each activity provides background information, key terms, and fun facts, so leaders don't need to be sound experts. They also include concise Field Notes-- a simplified version of the steps that can be printed out and used on the go.

The creative team designed these activities for all learners. This includes those with sensory sensitivities and accessibility needs. If you change these activities, please maintain these practices.

For example, for students who:

- Are blind or have low vision, use detailed verbal descriptions of directions, land features, and textures,
- Have mobility disabilities, choose locations that are along accessible routes,
- Are on the Autism spectrum, choose quiet, low-stimulation locations with room for movement,
- Are Deaf or hard-of-hearing, focus on vibrations and visual cues in addition to sounds.

These activities work best outdoors, but you need to keep some general rules in mind.

- Choose locations that fit the group size and specific activity steps.
- Arrange the group in ways that encourage active involvement for discussion. This often means spreading out or forming a circle.
- Improve comfort and accessibility by offering shelter, seating, and level terrain.
- Scout out all sites beforehand to identify any potential hazards such as holes or stinging insects.
- Know the location of drinking water and restrooms.

These activities offer a unique way to explore the environment and connect with sound. We hope you enjoy them!

Feel free to contact us with feedback or any questions: www.youngsoundseekers.org

Acknowledgments

Created by Dr. Nathan Wolek at Stetson University, Eve Payor at Atlantic Center for the Arts, and Edith Stein at the Florida School for the Deaf and Blind. The Young Sound Seekers program has been supported by the Natural Sounds and Night Skies Division of the National Park Service.

STETSON UNIVERSITY

ACA
Atlantic Center for the Arts
New Smyrna Beach, Florida

Educational Activities

Soundwalk 3–7
Attendees experience a contemplative walk for listening awareness. This activity allows listeners to focus and heighten their perception of the sounds in the environment, using their ears as their eyes. Note: this is also an activity suitable for those with hearing loss, but instead focusing on visual and tactile cues of sound vibration.

DIP TiPS 8–16
People are introduced to vocabulary for describing common features of sounds and demonstrate their understanding of these words by creating original sound events. This activity introduces the task of describing specific features of individual sound events.

Echoes of the Past 17–23
Attendees identify cultural and natural sounds of their location. The activity addresses how sounds influence culture throughout history and uses listening exercises to identify current and past cultural and natural sounds of their location.

Listen, Pair, Share 24–29
The group learns to perceive layers and distinguish components of the soundscape around them, while focusing attention completely on the task of listening.

Masking Mayhem 30–37
Listeners learn about the phenomenon of masking, or when sounds interfere with each other. The activity allows people to experience first-hand how we sometimes have trouble hearing an individual sound in a crowded soundscape.

Good Vibes 38–42
Listeners are introduced to qualities of sound that affect the health of all living beings, such as the stressors of noise pollution, and the benefits of a balanced soundscape.

Education Standards 43–45
Learn what educational standards are met in each of the educational activities.

Soundwalk Educational Activity

Objective

Attendees experience a contemplative walk for listening awareness. This activity allows listeners to focus and heighten their perception of the sounds in the environment, using their ears as their eyes.

Ages	10+
Group Size	10–20 students
Setting	Outdoors
Duration	30–60 minutes
Subject(s)	Health & Wellness, Environmental Science

Overview

Listening is a skill that requires practice. Soundwalks have a well-earned reputation for helping people practice active listening. There are many types of soundwalks. The most complex use headphones to create audio-guided tours. These can feature narration, sound effects, live performances, or processed recordings. But the simplest way to experience a soundwalk is to explore a location in silence, either alone or with others. Soundwalks can also include stops for reflection or discussion.

During a soundwalk, the group focuses on listening to the soundscape. This includes sounds they make themselves, like footsteps, coughs, or clothing rustling. It is impossible for the group to be completely silent. But the best way to practice the skill of active listening is by not talking. This can be challenging for younger audiences. The leader should model this by staying silent and holding space for the group.

Every soundwalk is unique to its time and location. The sounds change with the time of day, the weather, the season, animal migrations, and human activity. If you take the same group on the same route on a different day, your listeners should notice changes in the soundscape. Each soundwalk is a one-of-a-kind experience that won't happen the same way again.

Logistics

Scout your route ahead of time without the group. This will reveal any obstacles or safety concerns along the path (fallen trees, detours, etc.). Once on the soundwalk, the leader should keep their pace slow and relaxed. Allow people to listen at a leisurely pace. Plan for at least 30 minutes, but adjust the time based on the route.

A natural environment is ideal, but urban environments like a city park can also be an engaging place for a soundwalk. Bring a clock to track the time and a map, especially for wilderness trails.

Soundwalks can also be adapted for accessibility. For those with mobility challenges, you can turn this activity into a "sound sit," where everyone stays in one spot. This activity also works for those with hearing loss by focusing on visual and tactile cues like the vibration of sounds.

Important Vocabulary

Soundscape	The sounds heard in a particular location, considered as a whole.
Soundwalk	A contemplative walk through an environment for listening awareness.

Procedures

Step 1. Introduction and Prompt

A soundwalk is an activity to open the senses.

Say

"Here we are at [our location]. For the next hour we will be walking and listening to the soundscape. A soundscape is made of all the sounds at this location, including sounds we make while walking.

While we are walking, I'd like to request that no one speak so that we can focus on the sounds of our environment. Please silence your phones. Of course, if there is an emergency, let someone know that you need to peel off from the group. And if another hiker outside our group says hello, be polite and briefly respond. We just want to postpone our conversations until after the soundwalk is done.

Again, the purpose of this walk is to listen to the soundscape. The route we will take today is... (explain your route)."

Offer a listening prompt. This is an invitation to explore a theme or point of focus for the group to consider as they walk. Choose your own prompt based on the group learning objectives. Inspiration might come from environmental science, wellness, creativity, history, or culture. You may choose to include a creative activity at the end (before or after Step 3) such as creative writing, painting, or movement.

Sample Listening Prompts

- Listen for the closest sound. Then, listen for the furthest sound. Find your favorite sound.
- Listen to the changes in one sound.
- Focus on individual sounds. Then, listen for layers of sounds. And finally, listen to all the sounds at once.
- Find sounds that calm you / Find sounds that are stressful to you.
- Find sounds that are made by the Earth (wind, water, stones, etc.).
- Find sounds that are made by animals.

Say

"Before we begin, let's take three breaths together. Find a comfortable posture, relax your shoulders, and inhale... exhale... inhale... exhale... inhale... exhale.

Continue breathing at your own pace, focusing your mind on your breath. <pause>

Now, let's begin. I'll lead."

Procedures (continued)

Step 2. Walk Together

The group walks quietly behind the leader. Some attendees may wish to stray, so keep an eye on your group. Others may wish to rush forward in front of the leader. Keep your pace slow and deliberate to control the flow.

The walk itself is designed by the leader. We recommend you walk your route before you lead a group on this activity. Feel free to plan pauses at certain locations of interest (such as by water features or at an interesting sound). Your body language will communicate when it is time to stop and time to move on. If the route isn't a loop, the farthest point is a good spot for Step 3. After the discussion, you can let the group chat during the walk back.

Step 3. Discussion

At the end of the walk, stop at a safe clearing or return to your starting point. Motion to the group to create a circle. Wait for everyone to join the circle.

Say

"Let's take three (3) breaths together: inhale... exhale... inhale... exhale... inhale... exhale." <pause>

Ask

"I'd like to open our circle for sharing. What are you noticing?"

The questions in this discussion should match your listening prompt from Step 1. Create your questions before the walk, but be open to listeners' comments. Ask questions based on their feedback from the soundwalk.

Sample discussion questions

- Were you able to stay focused?
- How was this soundwalk different from a normal walk for you?
- What details did you hear?
- Were you able to hear a familiar sound in a new way?
- Did you hear an unexpected sound?
- Did any human-made sounds distract you from enjoying the natural ones?
- Did any memories come to you by listening to a sound?

Thank everyone for exploring their surroundings through a soundwalk. It's a skill that gets better with practice, so try it in different places and at various times of the year. Try it with the same group twice!

Fun Fact

"Listening is never static, cannot be held on to, and in fact needs to be found again and again." Hildegard Westerkamp

Fun Fact

The term 'soundwalk' was first used widely by Canadian composers R. Murray Schafer and Hildegard Westerkamp. Their aim was to draw attention to the sonic environment by teaching aspiring composers and the public new ways to listen. The World Soundscape Project

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Soundwalk Field Notes

Step 1. Introduction and Prompt

Say

Here we are at [our location]. For the next hour we will be walking and listening to the soundscape. A soundscape is made of all the sounds at this location, including sounds we make while walking.

While we are walking, I'd like to request that no one speak so that we can focus on the sounds of our environment. Of course, if there are emergencies or if another hiker says hello, you may briefly speak. Again, the purpose of this walk is to listen to the soundscape. So, please silence your phones. The route we will take today is... (explain your route). [Offer a listening prompt.]

Say

Before we begin, let's take three breaths together.

Find a comfortable posture, relax your shoulders, and:
inhale... exhale...
inhale... exhale...
inhale... exhale.

Continue breathing at your own pace, focusing your mind on your breath. <pause>

Now, let's begin. I'll lead.

Step 2. Walk Together

The group walks quietly behind the leader.

Step 3. Discussion

At the end of the walk, form a circle together.

Say

Let's take three breaths together:
inhale... exhale...
inhale... exhale...
inhale... exhale.

<pause>

Ask

I'd like to open our circle for sharing. What are you noticing?

[Add your questions for the reflection.]

Say

Thank you for trying something new and exploring your environment through our soundwalk.

DIP TiPS Educational Activity

Objective

This activity teaches how to describe features of sound events. The group will first learn six words related to sound. Then, they will play a game to show their understanding by creating sound events.

Ages	10+
Group Size	10–20 students
Setting	Indoors or outdoors
Duration	45–60 minutes
Subject(s)	Science, Special Skills

Overview

Talking about unfamiliar sounds can be tricky. Even though we listen all the time, it's often hard to find the right words to describe what we hear. If we know the source, we can simply name it (like "I hear a frog"). But if the sound is unfamiliar, we have to describe its traits (like "I hear short, high-pitched clicks"). Music vocabulary can sometimes help, but it doesn't always work for natural sounds. To describe unfamiliar sounds, we need to learn and practice specific vocabulary.

This first part of this activity uses a mnemonic device to help remember words for describing sounds. It focuses on six features: duration, intensity, pitch, timbre, pattern, and speed. Everyone can remember these with the mnemonic "DIP-TiPS." Working on this in a group helps everyone develop a shared understanding of these words.

In the second part, the group will practice making sounds that match prompts. You can decide to make this part competitive or non-competitive. The practice gives quick feedback and sparks lively debates. The leader should keep the activity both fun and organized for the best learning experience.

Logistics

No materials are necessary for this activity. Take time to clarify any terms the group may not know. You might consider creating flash cards or small signs with the vocabulary from the table in Step 3 printed on them. This would help attendees who are hard of hearing. It would also make your vocabulary presentation multimodal, a practice that helps different types of learners.

If you are working with a younger audience, you may want to shorten the list of features. Even with the first three features (DIP), there is plenty to say about sounds..

Important Vocabulary

Duration	The time interval between the beginning and end of a sound event. Small intervals are called “short”, while larger times seem “long”.
Intensity	Increases in intensity will make a source sound seem “louder”, while decreases will make it sound “softer”. This term has several synonyms like volume or loudness.
Pattern	Applies only to repeating sound events. During repetition, other traits in DIP-TiPS can vary to form patterns. Stable patterns will seem “regular”. Unstable, changing ones will seem “irregular”.
Pitch	The most prominent frequencies from a vibrating object will lead to our perception of its pitch. Even for non-musical sounds, we can use the perception of pitch to organize sounds from “low” to “high”.
Sound event	A sound from a specific source, such as birds calling from overhead or waves crashing on the shore.
Soundscape	The sounds heard in a particular location, considered as a whole.
Speed	Applies only to repeating sound events. The pace of these events determines their apparent speed. Repetitions seem “fast” when the events in close succession. They will seem “slow” when there are longer intervals between events.
Timbre	How complex are the frequencies within a sound event? A sound is “pure” if its timbre is focused on a single tone, like whistling. It’s “noisy” if the timbre is not focused, like shushing someone.

Procedures

The word “sound” in English has many applications. We could be talking about the sound of a place, or the sound of an animal, or raw acoustic energy that radiates through air and water. So, it is important to first clarify what we mean when we start talking about sound. This activity starts with broad concepts and then narrows to greater detail. If you’ve done listening exercises with a group, you can skip or shorten any redundant early steps. Try to build on previous discussions.

Step 1. Soundscape or Sound Event

Say

“All sounds at a particular location considered as a whole is known as its “soundscape”. The soundscape is part of what gives natural and historic sites their unique character. The National Park Service works to protect these soundscapes.”

The point is that saying “the sound of the park” is less clear than saying “the soundscape of the park.”

Procedures (continued)

Say
"The sound from a specific source is known as a "sound event," such as birds calling from overhead or waves crashing on the shore. The soundscape has many sound events. They sometimes work together and sometimes clash."

Emphasize that sound events are building blocks for the soundscape. The source may be unknown. But, asking someone to "describe that sound event" is clearer than saying "describe that sound."

Confirm the group knows the difference between soundscape and sound event

Ask
- What is your favorite soundscape? Is there a place that you like to sit and listen quietly?
- Are there any sound events that you don't like or make you uncomfortable?
- Take a minute to listen quietly to the soundscape at your present location. What sound events are most prominent in this soundscape? Are there any unknown sound sources?

Step 2. Listening Modes
Whenever we encounter new sound events, people use different strategies as they try to make sense of what they hear. Film sound scholar Michel Chion has proposed three common listening modes. These modes provide helpful language for exploring natural soundscapes. Introduce them now to help clarify later questions or conversations.

The first is also the most common: listening for source identification.

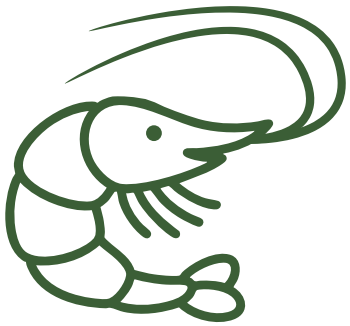
Ask
"When you hear a new or unfamiliar sound event, what questions do you ask yourselves?"

Sooner or later, someone will say, "What was that?" This is the key question in source identification. Take a moment to draw attention to three or four familiar sounds nearby. Make sure everyone agrees on their sources. In this mode, we are concerned with what is making the sound.

The second mode interprets messages or signals: listening for meaning.

Fun Fact

Although tiny in size, "Snapping shrimp" or "pistol shrimp", such as those found (and heard) in places such as Canaveral National Seashore and Dry Tortugas National Park, Florida, make one of the loudest animal noises in the ocean. They snap their claws so fast that they can create fast, tiny bubbles, which they use to stun prey. The "pop!" of the bubbles can reach 218 decibels. That's louder than a pistol shot!
- Ocean Conservation Research



Ask
"Can we list three or four different sound alarms that we hear in daily life? What do each of them mean?"

Examples might include "incoming text alert", "emergency vehicle siren", or "kitchen timer ding". You can connect these human-made sounds with some natural examples. Birds, frogs, and other animals often use different calls to signal each other for specific purposes. This could be a predator warning or approaching weather. In this mode, we are more concerned with meaning than source.

The third listening mode is the most challenging: listening for features. Start by referring to a specific sound event that someone has already mentioned during the activity. Ask a volunteer to describe the features of that sound (not its source or meaning).

Ask
"What are two features of that sound event that we can all agree on? (Or you can frame it as a challenge) How many specific features of that sound event can we all agree on without any repetition?"
How ever you frame the task, emphasize the importance of agreement here. Tell the group that agreeing on specific features helps us. It ensures we are talking about the same sound, especially when the source and meaning are unknown.

Step 3. Introducing DIP-TiPS

You are now ready to introduce the "DIP-TiPS". Speak the following terms one at a time and ask everybody to repeat after you:

- Duration
- Intensity
- Pitch
- Timbre (in the USA, typically pronounced "tam-burr")
- Pattern
- Speed

Say
"These are six common features that we can use to describe individual sound events. To make them easier to remember, we have developed a mnemonic device (or acronym)."

Walk everyone through the first letter of each word. Explain how they form the words DIP-TiPS. By far, the trickiest word in the group is "timbre". Its spelling and pronunciation come from the French language. Try not to get slowed down by these details during the initial introduction. Instead, focus on remembering these six words.

As you expand your explanation of the DIP-TiPS here, use the Important Vocabulary section. Do three things. First, emphasize the primary terms for these six features. After all, the acronym is only useful if it reminds us of the words represented by each letter. Second, introduce a short question that we are trying to answer for each feature. These questions will help the group begin to describe that specific feature of a given sound event.

Finally, introduce the secondary terms that describe the extremes for each feature. These extremes help listeners consider the variation within each feature. They also provide ways to describe differences or changes in sound events. This material is summarized in the following table:

Feature	Question	Extreme 1	Extreme 2
Duration	How much time?	Short	Long
Intensity	How loud?	Soft	Loud
Pitch	How high?	Low	High
Timbre	How noisy?	Pure	Noisy
Pattern	How organized?	Regular	Irregular
Speed	How fast?	Slow	Fast

Close out this step by speaking the terms one more time. Ask the group to repeat after you:
Duration, Intensity, Pitch, Timbre, Pattern, Speed.

Step 4. Creating Sound Events

The best way to learn the concepts behind DIP-TiPS is by practicing. The last step in this activity does that by encouraging creativity. The group will receive a set of sound features (like low pitch and long duration). Their job is to create sounds to match those descriptions. There's no single "right" way to make a matching sound. This is where creativity comes in.

A table of 16 paired descriptions is provided in the field notes to make it easy to give prompts. You can simply ask someone to pick a number. You also can also create your own method, like writing features on paper and drawing them randomly from a bag.
There are two ways to run this activity: non-competitive or competitive.

Non-Competitive Option

Call on volunteers to create a sound based on a prompt from the table. After they present, the whole group discusses how well the sound matches the description. As the leader, ensure feedback is constructive and supportive. The discussion will help clarify terms and ideas. This option works best for groups who don't know each other well.

Competitive Option

Divide the group into teams of 3-4. For each round, give a prompt from the table. Give the teams one minute to plan a sound that fits the description. After each team presents their sound, you can assign points. We recommend two for the most original sound, one for sounds that fit the description, and zero for sounds that don't match. Tally points over multiple rounds to find a winning team. Be sure to keep the game fun and relaxed, and focus on positive feedback to reinforce learning. This option is great for groups that already know each other or want to build stronger connections.

Both options are designed to help people learn vocabulary while having fun!

Procedures (continued)

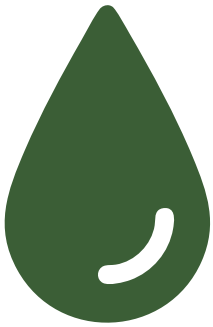
Final Thoughts

As you explore the different DIP-TiPS, there are a few key points to keep in mind. You can talk about these together at the end or bring them up throughout the activity:

- DIP-TiPS Work Together: No sound event is made up of just one feature. For example, a sound with speed will also have a pattern, and pitch always comes with duration and timbre.
- Recognizing Sounds: The way DIP-TiPS combine makes sounds unique. For instance, a bird's call is easy to recognize because it has a special mix of pitch and pattern.
- Describe or Compare: You can describe a sound event on its own (like "It's 2 seconds long") or compare it to another sound (like "It's shorter than the other sound").
- It's Okay to Struggle: Some features, like timbre or pitch, can be tricky to understand at first. Don't worry if it takes time—practice will make it easier.
- Start with What's Clear: Focus on the DIP-TiPS you understand best. Even if you only mention two or three features, it's usually enough to start a discussion about the sound.

Fun Fact

Sound travels faster in water compared with air because water particles are packed more densely. Thus, the energy the sound waves carry is transported faster. This should make the sound seem louder.
Scientific American



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DIP TiPS Field Notes

Step 1. Soundscape or Sound Event

- Explain that the overall sound at a location is called its "soundscape". This contributes to the unique character of natural and historic sites.
- Introduce "sound event" as a specific sound from a source, like birds or waves. These are the building blocks of a soundscape.
- Use discussion questions to check if the group can tell the difference between "soundscape" and "sound event".

Step 2. Listening Modes

- Describe the different strategies people use to make sense of new sound events.
- The first mode is "listening for source identification." The group considers, "What was that?" when encountering an unfamiliar sound.
- The second mode is "listening for meaning." The group identifies specific alarms or natural calls that act as signals.
- The third mode is "listening for features." The group agrees on specific traits of a sound. They focus on its characteristics, not its source or meaning.

Step 3. Introducing DIP-TiPS

- Introduce the six common features used to describe sound events. Emphasizing the DIP-TiPS acronym and focusing on these primary terms: Duration, Intensity, Pitch, Timbre, Pattern, Speed.
- Explain that each feature corresponds to a key question. Help the group describe specific traits of sound events.
- Mention secondary terms for each feature's extremes. This will help everyone understand variations and changes in sound events.
    - Duration: How long does it last for?
    - Intensity: How loud or soft is it?
    - Pitch: How high or low?
    - Timbre: How pure or noisy?
    - Pattern: Is it a regular or irregular pattern?
    - Speed: How fast or slow is it?

Step 4. Creating Sound Events

- To solidify DIP-TiPS concepts, ask the group to make sounds that match given features.
- Use the descriptions as prompts. Or, explore other random prompt-generation methods.

Non-Competitive Option

Call on volunteers to create sounds. Then, have a group discussion and give feedback.

Competitive Option

Organize teams. Provide prompts and give teams one minute to create sounds. Assign points based on originality and accuracy. Play multiple rounds, tally points, and determine a winning team. Keep the atmosphere fun and educational.

Final Discussion

- DIP-TiPS are never found in isolation; sound events always combine features.
- Specific combinations of DIP-TiPS make sources recognizable. For example, unique bird calls are defined by pitch and pattern.
- Don't get discouraged if some features are difficult to understand. Focus on the DIP-TiPS you hear clearly and practice to improve.

Descriptions

Mix and match the following to describe the sound event.

Duration

- Short
- Long

Intensity

- Soft
- Loud

Pitch

- Low
- High

Timbre

- Pure
- Noisy

Pattern

- Regular
- Irregular

Speed

- Slow
- Fast

Echoes of the Past Educational Activity

Objective

The group will discuss the cultural and natural sounds of their location. They will first identify important sounds of the present, then imagine historic sounds from the past. The discussion introduces two categories for sounds: intrinsic and extrinsic. This activity pairs well with a history presentation at a cultural site.

Ages	10+
Group Size	10–20 students
Setting	Outdoors
Duration	30 minutes
Subject(s)	Science, Special Skills, Social Science

Overview

The soundscape changes over time. This is the result of many forces. Geological processes can shape the coastline and mountain ranges. Animal migration can bring new calls and songs. Human technology can introduce new materials and machines.

This activity works well at a culturally significant site, but it could be any place that has experienced change. The leader starts with some history to show how the location has changed over time. If you're not familiar with the history, invite a park ranger or local historian to help. These details help connect sounds to cultural and natural history.

The group will also discuss which sounds belong at the site. To do this, you will introduce two categories used by the National Park Service: intrinsic and extrinsic. Intrinsic sounds fit with the location's soundscape. Extrinsic sounds are not appropriate for a given site. These categories can guide both discussions and decisions.

Logistics

This activity is most effective when done at a site with cultural importance or with layers of history. If you do not feel you know the history well enough, work with a local park ranger or interpretation specialist. Ask them to prepare a 5–10 minute presentation about the site to start the activity. Make sure they understand the main goal of focusing on soundscape. This context can help them focus less on dates and details that are unrelated. If you are comfortable with the history, prepare something yourself.

Find a comfortable place at the site to gather the group and sit. Consider how much seating is available, if the ground is suitable for sitting, and how to keep the group protected from weather.

You may choose to extend Step 2 of this activity by playing some sound examples for the group. This would require a portable audio player. We recommend a Bluetooth speaker paired with a smartphone, laptop, or tablet. The examples you play should be human-made sounds that mimic natural sounds. Some examples are the sound of a rain stick or indigenous throat singing. Search online for these sounds before beginning the activity and have them ready for Step 2.

Important Vocabulary

Acoustics	How sound behaves in a space; The branch of physics concerned with the properties of sound.
Environmental history	The changing ways people think about, affect, and use ecosystems over time
Extrinsic sounds	Sounds that do not form an essential part of the park experience
Intrinsic sounds	Cultural, historic, and natural sounds that belong within the park experience
Noise	Unwanted sound. The difference between sound and noise depends upon the listener and the circumstances.
Recreation	Activity done for fun.
Soundscape	All the sounds heard in a specific location.

Procedures

Step 1. Listening Through Time

Start with the prepared presentation of the site's cultural history. Use as many descriptors as possible. Include cardinal directions, land features, colors, textures, and other identifiers. Include a brief Q&A if time allows.

Next, shift the focus to sounds. Use the following questions to start discussion, beginning with the present year and working backwards through time. Within each period, discuss examples of changing technology. The goal is for people to imagine how sounds change over time.

Ask
What sounds do you hear right now?

Draw the group's attention to a variety of natural sound sources (animals, wind, water) as well as human-made sounds. For the human-made sounds, take a few minutes to discuss the different types or categories. For example: communication, transportation, recreation, cooking/eating.

Ask
Which of these sounds are fairly new to this place? In other words, which of the things making the sounds we hear now weren't around until recently?

Guide the group to think about smartphones, electric vehicles, and other recent technologies. Consider whether other sound sources have been added or subtracted within the past few years, such as use of shuttle busses instead of personal vehicles, or a new trail.

Say
Imagine being here in the 1990s or early 2000s.

Procedures (continued)

Ask
What sounds would people here have heard then? Which of the sounds would have been loudest or most common?

Depending on the site, road vehicles and airplanes are likely the most dominant human-made sound sources. If need be, prompt the group to think about transportation.

Say
Next, think back to the 1950s or 1960s.

Ask
How would sounds then have been different from the sounds from the 1990s or today?

Again depending on the site, cars may be a notable sound source. Many parks invested in building roads, parking lots, and hiking trails during this era. However, the park may not even have been established by the mid-20th century. Encourage the group to think about changes in recreation over time.

Say
Now think about the late 19th century and beginning of the 20th century.

Ask
What was this land being used for then? How were people moving from place to place? What tools or technology were they using for work, food, and communication?

Again, specifics will depend on the site. Generally, transportation technology may have included horses, buggies/wagons, or trains. Steam-powered machines may have been present, or people may have been farming or hunting. Perhaps point out that newspapers and telegraphs share information silently, as compared to talking on a phone or watching videos on the internet. The idea of "parks" was still fairly new.

Ask
When did Europeans arrive in this location? What technologies did they bring with them? Did they begin making changes to the land?

Depending on the timing and location, this may mean horses and guns, or plowing fields and chopping down forests, etc. Rather than try to develop a comprehensive list, guide the group to think about how the new technology and different land use (if applicable) would have changed the soundscape.

Ask
What would this place have sounded like before European settlers arrived? What were people native to this land using for transportation, food, communication, and recreation? What sounds are still present today?

If applicable, discuss multiple native nations tied to the site, and how sounds may have differed culture to culture. Emphasize that native peoples aren't ancient history. Although they use different tools and technologies today than they did generations ago, they may still have many of the same cultural practices, such as ceremonies.

Procedures (continued)

Step 2. Connections

Read the following quote from Dr. Bernie Krause, a soundscape expert and audio field recordist.

Speaking about our ancient ancestors, "our imagination and our innate need to hear relationships between sounds would have been first stimulated by the voices of the tropical and temperate forest, deserts, high plains, tundra, and coastal regions, where we camped, hunted, and listened. This would have served as a template from which to arrange our own sounds – made with our voices and early instruments. While we were carefully listening, we would have transformed what we heard into expressions that reflected immediate links to the world around us."

For example, "a tribe once completely isolated in the tropical Brazilian mountains and rainforests, the Yanomami use rain sticks to incorporate their acoustic environment into their ceremonies and music… Inuit groups who live in the Northwest Territories of Canada emulate in their music the constant wind that roars across the open plains and tundra, the strongest natural acoustic presence of their environments. By subtle manipulation of sound's resonance as it comes from their throats, the singers can generate multiple harmonics that leave the impression of many voices simultaneously coming from one source."

Optional extension

Share other local examples of human-made sounds that mimic natural sounds. Feel free to add or swap Krause's examples from Brazil and Canada with sounds that have a clear connection to your local park. Consider playing these for the group using a portable audio player, then discuss.

Fun Facts

The name of the Native American tribe, Wy'am means 'echo of falling water,' which came from the sounds of Celilo waterfall along the Columbia River before it was muted by the flooding from The Dalles Dam (nearby Portland, Oregon).
Bernie Krause

The National Park Service has its own jazz band! The Arrowhead Jazz Band celebrates part of the country's musical legacy, playing at the New Orleans Jazz National Historical Park in Louisiana.
New Orleans Jazz National Historical Park

Procedures (continued)

Step 3. Intrinsic vs. Extrinsic Sounds

Provide definitions for intrinsic and extrinsic sounds. This will shift the discussion to how sounds affect culture and well-being.

Say

Intrinsic sounds are cultural, historic, and natural sounds that belong within the park experience. Extrinsic sounds are sounds that do not form an essential part of the park experience.

Draw attention to examples of intrinsic and extrinsic sounds from Step 1. Focus on those heard during the visit. Then, use these questions to continue the discussion.

Ask

What sounds do you enjoy in this environment? Are the sounds intrinsic or extrinsic?

Are any of these sounds common in your everyday experience?

Do any of those sounds inspire you to be creative? To sing or dance?

Which sounds add to a positive experience for park visitors?

Which sounds distract from your enjoyment of the park?

What would you like to change about the soundscape in this location?

Fun Fact

Many places are named for the sounds heard there. For example:

- Wolf Island (Voyageurs National Park) was named by residents who could hear wolves howling from the highest point.
- Kūpinaʻi Pali (Hawai'i Volcanoes National Park) translates to "the echoing cliff".
- Exclamation Point (Black Canyon of the Gunnison National Park) hints at the sound visitors make when they see the view.
- Silent City (in Bryce Canyon National Park) reflects the remarkably quiet pockets tucked between the rock formations.

Geographical Place Names of Voyageurs National Park, Hawai'i Volcanoes Restoration of Indigenous Place Names, Black Canyon of the Gunnison National Park, Bryce Canyon National Park

Resources

Black Canyon of the Gunnison National Park. Map. https://www.nps.gov/blca/planyourvisit/maps.htm

Bryce Canyon National Park. Map. https://www.nps.gov/brca/planyourvisit/maps.htm

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Acknowledgments

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STETSON UNIVERSITY

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New Smyrna Beach, Florida

Echoes of the Past Field Notes

Deliver an introduction to your group about the location and how it has developed over time. This should focus on cultural history but could also include key environmental changes.

Step 1. Listening Through Time

- Begin with the present day and ask volunteers to name sounds that they hear at the current location.
- Highlight the sounds that are fairly new and unique to the current day soundscape.
- Guide the group in thinking about these approximate periods one at a time:
  - 1990s - early 2000s (turn of the 21st century)
  - 1950s - 1960s (mid 20th century)
  - Late 19th to early 20th century
  - Arrival of Europeans or Euro-Americans
  - Pre-European contact Native American, Alaska Native, and/or Pacific Islander cultures
- For each period, focus on three essential questions:
  - How would a visit to this site sound different?
  - What sounds from that period are missing from today?
  - What sounds from the present would be missing?

Step 2. Connections

Read the quote from Dr. Bernie Krause. There are many examples of people mimicking natural sounds in both ancient and indigenous cultures. These sounds were often incorporated into music and ceremonies.

- Yanomami people in the Brazilian mountains and rainforests use rain sticks to evoke the familiar sound of precipitation.
- Inuit groups in the Northwest Territories of Canada emulate the roar of wind by manipulating the resonance of their throat.
- Ask the group to consider if there are ways that natural sounds still influence our present lives.
- Optional extension: Play examples of human-made sounds that mimic natural sounds.

Step 3. Intrinsic vs. Extrinsic Sounds

- Explain that intrinsic sounds include cultural, historic, natural sounds that belong within the park experience. Contrast these with extrinsic sounds, which are not essential parts of the park experience.
- Call attention to one example of each at the current location.
- Guide the group in reflection on the differences between intrinsic and extrinsic sounds using the following questions:
  - Which sounds do you enjoy most in this location?
  - Do any sounds relate to your everyday experience?
  - Do any sounds inspire you to be creative?
  - Which sounds distract from enjoyment of this location?
- Wrap up the conversation with a final hypothetical question: What would you like to change about the soundscape in this location?

Listen, Pair, Share Educational Activity

Objective

The group will practice focusing on the sounds around them in the soundscape. They will think about why it's important to listen for individual layers. During small group conversations, they can sort the sounds into categories. Each small group then shares their thoughts and memories.

Ages	10+
Group Size	10–20 students
Setting	Indoors or outdoors
Duration	45 minutes
Subject(s)	Environmental Science

Overview

When first learning to discuss sound, people need structure. The design of this activity helps the group develop their active listening skills. They will learn to focus their attention on parts of the soundscape. This process is like peeling layers of an onion. It involves separating human-made and natural sounds.

Active listening takes practice. For your first try with a group, just focus on how to listen. After that, the activity is flexible. Leaders can use it to discuss various listening topics. We provide a few suggested prompts, but feel free to create your own.

Adapting the Think-Pair-Share method encourages active learning. Small group discussions allow people to develop their ideas first. They are then more confident when sharing with the larger group.

Logistics

When choosing a location, think about the size of the group and how you will ask people to arrange themselves at each step. During the listening phase, people may wish to spread out or sit down. During the pairing phase, people need to be close enough to have a conversation with their partner. During the sharing step, it works best when everyone can form a circle, either seated or standing. This shows that everyone has something to offer the group. Choose a location that can support all these arrangements.

During the Pair (Step 2) and Share (Step 3) stages, the leader will need to decide who speaks first. We've all experienced an eager volunteer who always wants to talk first. Picking someone with a silly question helps get more people involved and avoids anyone dominating the conversation. Here are some suggestions:

- Whose birthday is the closest (or farthest) to today?
- Which group has the biggest (or smallest) difference in age?
- Whose last name has the most (or fewest) letters in it?
- Which group has the most items in their pockets combined?
- Who was born the farthest away from (or closest to) our current location?
- Which group has the most siblings (or pets) combined?

Important Vocabulary

Anthropophony	The sounds created by humans and machines, such as car horns or airplanes.
Biophony	The sounds of plants and animals, such as frogs croaking or birds chirping.
Extrinsic Sounds	Sounds not forming an essential part of the experience of a location.
Geophony	The sounds of the earth, such as wind blowing or waves crashing.
Intrinsic Sounds	Cultural, historic, and natural sounds that belong within the experience of a location.
Noise	Unwanted or disruptive sound. The difference between sound and noise often depends upon who is listening and the situation.
Sound	Vibrations that travel through the air or another medium. These vibrations can be heard when they reach a person's or animal's ear.
Soundscape	The sounds heard in a particular location, considered as a whole.

Procedures

Step 1. Listen

Spread out. Everyone needs space but should be close enough to regroup when asked. Allow the group to get comfortable. Some people may want to sit while others remain standing.

Say

"Let's start by being as silent as possible. That means we need to be still, silence our phones and watches, and breathe comfortably. This will help us focus on the soundscape around us. The soundscape includes all the sounds in this location, like a landscape of sound. How long do you think we can silently listen to the soundscape?"

Pause for some discussion about this question.

Say

"We are going to listen for 60 seconds. I will start a timer when we begin, and I will let you know when the time is up. You might want to close your eyes to help focus your attention on the soundscape. You can sit or stand, whichever is more comfortable for you. Is everyone comfortable and ready? Let's give our full attention to the soundscape."

Start the timer. At the end of 60 seconds, gently regain everyone's attention. Do not make any sudden or loud sounds.

Procedures (continued)

Step 2. Pair

Tell everyone to pair up with someone nearby, but don't let small groups grow beyond two or three people. This will help keep everyone engaged. Choose one or two of these discussion questions to guide their conversations:

- What individual sounds did you hear?
- What individual sounds did you like/dislike?
- What was the loudest/quietest sound that you heard?
- What was the closest/farthest sound that you heard?

Give the small groups five minutes to talk about the prompt with their partners. Watch the time closely and provide a halfway warning so everyone has an opportunity to contribute equally.

As a final step, ask each group to nominate a spokesperson. Explain that they will summarize the group's discussions for everyone. Then, give them another minute to prepare their report.

Step 3. Share

Gather everyone together in a circle with the leader in the center. Remind people that there are no wrong answers. We need to refrain from judging the quality of responses. Use the earlier suggestions (under Logistics) to determine which spokesperson will report first. After the first report, proceed clockwise or counterclockwise around the circle. Make sure that every spokesperson has a chance to share what their group discussed.

After the initial reports, use any of these topics to extend the discussion:

- Discuss the differences between human sounds and natural sounds. Ask participants to ignore any human sounds and only focus on the natural sounds.
- Introduce the terms biophony, geophony, and anthropophony. These are three categories of sounds proposed by Dr. Bernie Krause. Ask participants to identify one example of each that is present in this soundscape.
- Introduce the difference between sound and noise (unwanted sound). Ask participants to consider whether specific sounds they mentioned were sound or noise.
- Introduce the concept of intrinsic and extrinsic sounds for the area. Ask the group to listen for examples of intrinsic sounds that help define this area. Identify and discuss extrinsic sounds that might interfere with their listening.

Fun Fact

"A man in Anaktuvuk Pass [an Alaska Native village within the borders of Gates of the Arctic National Park and Preserve, Alaska], in response to a question about what he did when he visited a new place, said…, "I listen." That's all. I listen, he meant, to what the land is saying. I walk around in it and strain my senses in appreciation of it for a long time before I, myself, ever speak a word."
Barry Lopez, Arctic Dreams

Procedures (continued)

Final Discussion

You can engage the group in further conversation by asking any of the following questions:

- What can we understand about this area after listening to the soundscape?
- Were there any individual sounds that your group could not identify the source of? How did you talk about the sound without knowing its source? Were you able to point out certain features?
- How difficult was it to ignore human sounds and pay attention to natural sounds? Why do you think human sounds dominate our attention so easily?
- Imagine you are one of the birds found in this area. How might features in the local geophony and anthropophony affect your communication with other birds? How might you adapt to improve communication?
- Did your group disagree with another group's classification of a specific sound as noise? Why did your group reach a different conclusion?

Fun Fact

What is the difference between hearing and listening? Hearing is the function or power of perceiving a sound. Listening is the ability to perceive with thoughtful attention. Listening requires focus, meaning it's active. Hearing is passive because it is a mechanical function of the body. Listening allows understanding to happen.
Keywords in Sound

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Listen Pair Share Field Notes

Preparation

- Choose one to five listening locations for the group to visit.
- During travel between locations, the group is free to engage in conversations and make other appropriate sounds.
- While at a designated listening location, the group will need to be as silent as possible.
- At each location, complete Steps 1–3.
- Before the first iteration, explain soundscape as the sounds heard in a location, considered as a whole.

Step 1. Listen

- Remind everyone about active listening and the need to be as silent as possible.
- Ask for feedback from the group about how long to listen (30 seconds, 60 seconds, or more?) and arrive at consensus on the duration.
- Allow participants to spread out and find a comfortable spot.
- Remind the group that you will watch the clock so they can focus on listening and begin monitoring time.

Step 2. Pair

- After listening for the full duration, gently regain everyone's attention.
- Have participants select a partner for discussion, but no more than three in each group.
- Provide one or two question prompts to guide their conversations.
- Give the groups five minutes to discuss and begin monitoring time. Announce the halfway point to ensure everyone has a turn to talk.
- Ask each group to select a spokesperson.

Step 3. Share

- Gather everybody together again, forming a circle.
- Remind everyone that there are no wrong answers.
- Proceed around the circle, giving each spokesperson an opportunity to report on their pair's conversation.
- After the last spokesperson, summarize the major points you want the group to take away.
- Travel to the next location and return to Step 1, or proceed with final discussion.

Final Discussion

- What can we understand about each listening location through its soundscape?
- Do you think any features of this local soundscape affect animal communication?
- Were there any disagreements in your conversations about specific sounds? How did you navigate them to reach consensus?

Masking Mayhem Educational Activity

Objective

This activity introduces masking, or sounds interfering with each other. The group will experience the challenges of picking out a single sound in a noisy environment.

Ages	10+
Group Size	10–20 students
Setting	Indoors or outdoors
Duration	40 minutes
Subject(s)	Science, Life Sciences

Overview

How quiet or loud is that sound? There are several overlapping terms for this property of sound. Many people say volume. Technical writings might use loudness or amplitude. Musicians talk about dynamics with borrowed Italian words (piano, forte, etc). We prefer the term "intensity" over these alternatives. We try to use it consistently throughout the following activity.

Intensity contributes directly to objective measurements like sound level, typically measured in decibels. This unit of measurement allows sounds to have an objective, quantifiable measurement. The scale used for decibels is often calibrated to human hearing. 0 dB is literally the threshold of the quietest sounds humans can possibly hear. Measuring decibels is optional in this activity, but it gives a hands-on way to learn about this unit.

This activity shows how a noisy location can make it difficult to hear specific sounds. It poses the question, "Can we hear one person clearly in a crowded soundscape?" Members of the group will need to take on different roles. Some people will create sounds, while others carefully listen. At the end, everyone can share thoughts on how sounds balance or compete based on their intensity. These observations help the group understand noise management in other contexts.

Logistics

This activity works best with the group in a semicircle formation. They could be sitting on the floor, seated at tables, or standing up.

The following materials are recommended:

- watch, or another device to monitor time
- an approved sound level app, website or device

Important Vocabulary

Decibels	The standard unit of measurement for the sound level (also known as "dB SPL"). Whether a sound is too loud or too quiet can often be subjective. Decibels provide a consistent, objective measurement.
Intensity	An acoustic property that affects the perceived sound level. Increases in intensity will make a sound louder, while decreases will make it sound softer.
Masking	When the presence of one sound affects or interferes with the perception of a second sound.
Sound Level Meter	These devices enable quantitative measurements of sound level in decibels (dB). There are many smartphone apps that perform this function, including the free NIOSH SLM app.

Procedures

Introduce the term "intensity" and explain that this property or trait describes how loud or quiet a specific sound seems to our ears. Explain that this activity will explore the role of intensity in hearing sounds clearly.

The activity requires three roles that are explained in greater detail below:

- solo volunteer
- listeners
- maskers

Step 1. Prepare a Volunteer

The first step in this activity is selecting a volunteer who will help with your demonstration.

Say

I need a volunteer for a special role. Before anyone offers, let me explain that this person needs to be capable of speaking at different intensity levels.

If no one volunteers, then ask "Who's 75% confident they could do this? What can I clarify to make you more confident?"

Have the volunteer join you in front of the group.

Say

[to the volunteer]: Pick a two-syllable word or phrase that you can confidently repeat over and over. It could be nonsense like "bah-bah", or an actual phrase like "hey-you-hey-you". Choose something that will be easy to repeat continuously. Avoid anything like a tongue twister, because you do not want to get tired quickly.

Ask them to start by repeating the phrase at the intensity level of a normal conversation. See if they can repeat it for 10 seconds while you monitor the time with a watch.

Procedures (continued)

Work with the volunteer to adjust the level or phrase so that they are confident. Then, check in with the rest of the group to make sure that everyone can hear your volunteer. After agreeing that the phrase is appropriate, and they have a sense of the normal conversation level.

Say
[to the volunteer]: Now you are going to repeat your phrase at two other levels of intensity: soft but audible and loud but controlled. First, make your sound as quiet as possible, but still audible to everyone in the space. You want your voice to get softer, but the level needs to remain louder than the background noise here. Next, make your voice louder than normal, but still controlled. You want your voice to get louder, but you don't need to scream or strain your voice.

As they practice these softer and louder intensity levels, offer constructive feedback. Ensure that they are producing three easily distinguished intensity levels.

Say
[to the volunteer]: Now that you have your phrase and three intensity levels, I want to practice directing you. I will use four directions: "soft", "norm", "loud" and "stop". Your job is to react with your chosen phrase at the corresponding intensity level. Let's practice together before we get to the main demonstration.

Say
[to the whole group]: Please listen so that you can provide feedback afterward.

Begin with a basic sequence like "norm-soft-norm-loud-norm-stop". Pause for about 5 to 10 seconds between each intensity direction. It's important to not change intensity too quickly, because the group will need time to perceive the change. Make sure your directions are loud enough to be heard above the volunteer's voice. You should also make sure your directions don't come across as demanding or demeaning. If you choose, you can extend this practice with more complex patterns of intensity.

Ask
[the volunteer]: Do you feel comfortable and confident in your role?

Ask
[the whole group]: Do you have feedback? Can you hear the volunteer at all three intensity levels? Are there any dead spots in the space where it is harder to hear? (If needed, adjust to ensure the success of the rest of the demonstration.) Any other initial observations?

As the group shares observations, take note of anyone who eagerly volunteers. This might help you identify the extroverts early and prepare to get others more involved as the discussion progresses.

Fun Fact

Why can't you hear someone talking when the water faucet is running? It is because low frequency sounds mask higher frequency sounds which are softer at the listener's ear.
- HyperPhysics, Georgia State University

Procedures (continued)

Step 2. Prepare the Group

The next step in this activity is dividing the group into two different roles.

Say

[to the whole group]: Let's count off "1, 2, 3, 1, 2, 3..." around the space. Everyone remember your number.

This should result in subgroups that is mixed. The demonstration will make use of this intermingling, so do not let anyone move or ask the subgroups to cluster.

Introduce the term "masking" - when the presence of one sound affects or interferes with the perception of a second sound.

Say

People who work with sound use this word to describe the way certain sounds prevent us from hearing other sounds. The group is going to help us demonstrate this through their two roles: "maskers" or "listeners". We have two distinct roles because it is difficult to both make sound and listen carefully at the same time. Everyone in group 1 raise your hand. You are now "listeners". You won't be making any sound, but this is not a passive role. It's a very active and important part of the demonstration. By listening together and sharing your observations, you will help us better understand masking.

Say

[to the whole group]: Let's give the listeners a chance to practice. Everyone please be as quiet as possible. I'm going to watch the time for 10 seconds while the group is silent. When time is up, I'll ask our listeners to share their observations. OK? [Follow through and watch the time.]

Ask

[the listeners]: Can you share any initial observations with everyone? What sounds are you noticing in this space?

Say

[to the whole group]: Everyone in group 2 and 3 raise your hand. You are now working together as "maskers". Your job is to pair up with the person next to you and make conversation, each two working with a three and vice versa. Start with quick introductions in case you don't already know each other. Then take 30 seconds to agree on some discussion topics or questions. Avoid simple yes-no questions because you will need to sustain the conversation for a few minutes. You should find topics that are interesting for both of you and avoid topics that are too one-sided.

Allow a few minutes for these introductions. After you've regained the group's attention, check with each pair of maskers and ask if everything is clear about their role. Answering their questions now can increase the chances of success for the demonstration. If necessary, advise them that the conversation does not need to be as loud as possible. The masking effect should work with a normal conversation level.

Procedures (continued)

Step 3. Demonstration

Say

Let's review everyone's individual roles:

- The volunteer will be repeating a two-syllable phrase at three different intensity levels.
- The maskers will be engaged in conversation pairs.
- The listeners will be focused on trying to hear the volunteer over the maskers.

Ask

Do any of the listeners have a hypothesis about what will happen? Will the volunteer be audible at all three intensity levels? Will they be masked entirely by the conversations?

Make note of these hypotheses so that you can revisit them after the demonstration.

Follow these steps with the group as you monitor time with your watch:

- Everyone quiet for 10 seconds.
- Start maskers in conversations. Wait 10 seconds.
- Tell the volunteer to start by saying "norm." Wait 10 seconds.
- Tell the volunteer "soft." Wait 10 seconds.
- Tell the volunteer "norm." Wait 10 seconds.
- Tell the volunteer "loud." Wait 10 seconds.
- Tell the volunteer "norm."
- Repeat the commands or improvise other variations.
- End the demonstration and ask everyone to return to quiet.

Step 4. Initial responses

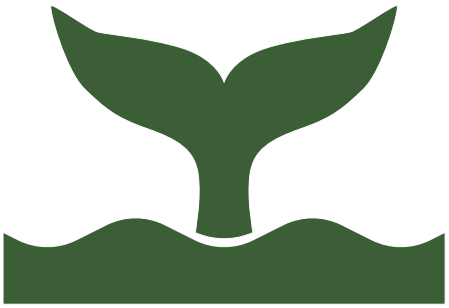
Ask

- Listeners who shared a hypothesis before, explain if your experience confirmed it or not.
- Do any of the remaining listeners want to share their experience? Were you able to hear the volunteer clearly at every level?
- Do any of the maskers want to share their experience? Were you able to focus on your individual conversations, or did the intensity level of other sounds distract them? Did you change the intensity of your conversation in response to any of the other sounds?
- Volunteer, share your experience. Were you able to produce your vocalizations at consistent levels? Did you get tired trying to make yourself heard?
- Are there any general observations we can make about masking based on this demonstration?

Fun Fact

Constant underwater noise generated by vessels can be perceived by marine mammals as an "acoustic fog". Some species, such as fin whales, stop singing when man-made noise levels drown out (or mask) their calls. Others, such as orcas, "speak up" and call more loudly when background noise gets louder.

OceanCare Marine Conservation and Holt et al., 2009



Procedures (continued)

Step 5. Optional Extensions

The following are brief suggestions for extending this activity beyond the basic demonstration.

- Changing roles: Since there are three different roles, you could repeat the activity. Different people could take turns as the solo volunteer, listeners, and maskers.
- Sound level meter: If you are comfortable using one of these devices, use it to measure the decibels at each step. Many sources cite 60 dB as the intensity level of a normal conversation. Use this as a benchmark for the "norm" level of your volunteer. Their soft intensity would then be 6 to 10 dB lower, and the loud intensity should be 6 to 10 dB higher.
- Animal ears: The NPS Junior Ranger Sounds Explorer workbook features an activity about animal ears. You can use cupped hands to explore the shape of different animal ears. Other items like paper towel rolls provide quick, inexpensive ways to reshape the human ear. The demonstration in Step 3 could be repeated with some of the listeners reshaping their ears before the start.
- Ear plugs: Ear plugs can be purchased at most drug stores. When placed in the ear canal, they will lower the perceived intensity of sound overall. A few volunteers could wear ear plugs while the group repeats the demonstration.

Final Discussion

After completing this activity, continue the conversation by using the following discussion prompts:

- How would you summarize the relationship between intensity and masking? Were loud sounds easy to hear over the conversations? Were soft sounds completely covered by the conversations?
- Which sounds were the most (or least) effective for masking?
- Have you ever experienced a loud sound that blocked out another sound? Would anyone be willing to share their example with the group?
- Sometimes we want to hear soft sounds, but loud ones get in the way. What actions can we personally take to hear those soft sounds clearly? What actions can we reasonably ask others to take?
- How do you think animals are affected by masking in their natural habitats?

Fun Fact

When you visit a park, you may see different birds along a trail than you will near a road, due to masking. A study in Prince William Forest Park and Manassas National Battlefield, VA, found that birds will avoid roads when their calls can't be heard. But some birdsongs are in a different frequency range than typical traffic noise. These species don't seem to mind being by a road.
Goodwin & Shriver, 2011

Resources

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Masking Mayhem Field Notes

Step 1. Prepare a Volunteer

- Select a volunteer who is comfortable with their voice and not shy about being at the group's center.
- Choose a two-syllable phrase to repeat such as "bah-bah" or "hey-you-hey-you."
- Instruct the volunteer to repeat the phrase for 10 seconds at normal volume, then confirm everyone can hear clearly.
- Coach the volunteer to vary the intensity, making the phrase softer and louder without shouting.
- Practice directing your volunteer to change intensity with four short commands: "soft," "norm," "loud," and "stop."
- Confirm that your volunteer is comfortable and that the group can clearly hear at all three levels.

Step 2. Prepare the Group

- Have participants count off "1, 2, 3" to assign them other roles.
- Introduce the concept of masking: one sound can prevent hearing another sound clearly.
- 1s will be "listeners", tasked with actively focusing on the soundscape.
- Listen silently to the location for 10 seconds. Ask listeners to share what they are noticing about the soundscape.
- 2s and 3s will be "maskers", tasked with creating conversation in pairs.
- Allow 30 seconds for maskers to introduce themselves and brainstorm topics. Advise them to maintain a natural conversation volume.

Step 3. Demonstration

- Remind everyone of their individual roles.
- Ask listeners if anyone has a hypothesis about what will happen.

Follow this outline:

- Everyone quiet for 10 seconds.
- Start maskers in conversations. Wait 10 seconds
- Tell the volunteer to start by saying "norm." Wait 10 seconds.
- Tell the volunteer "soft." Wait 10 seconds.
- Tell the volunteer "norm." Wait 10 seconds.
- Tell the volunteer "loud." Wait 10 seconds.
- Tell the volunteer "norm."
- Repeat the commands or improvise other variations.
- End the demonstration and ask everyone to return to quiet.

Step 4. Initial Responses

- Review hypotheses and ask listeners, maskers, and a volunteer to share their experiences.
- Return to the concept of masking. Ask participants for feedback and insights based on the activity.

Final discussion

- How does intensity affect masking? Were loud sounds clearer, and were soft sounds difficult to hear?
- Would anyone be willing to share an example of masking from your past experience?
- What actions can help us hear soft sounds more clearly in noisy environments?
- How do you think animals are affected by masking in their natural habitats?

Good Vibes Educational Activity

Objective

Listeners are introduced to qualities of sound that affect the health of all living beings, such as the stressors of noise pollution, and the benefits of a balanced soundscape.

Ages	10+
Group Size	10–20 students
Setting	Outdoors
Duration	20–30 minutes
Subject(s)	Science, Special Skills, Social Science

Overview

This activity explores how different sounds affect health. It works best in a spot where both natural and human-made sounds are present. If desired, the leader can preface with a presentation regarding the site's current conditions including the environmental and/ or urban surroundings. The activity begins with silent listening. The group then shares different sounds that they notice at this location. During discussion, they'll identify sounds that affect human health and wellness. The group will look at how sounds make them feel, as well as how noise pollution makes communication harder. The goal is to talk about ways to protect or improve the natural sound environment.

Logistics

Chose a comfortable place to gather and sit. It could be a seating area protected from the weather, or on the ground if the conditions are right. For the discussions, a circle formation will offer an equal opportunity for all to share.

Fun Fact

Muir Woods National Monument in California has made part of the park, Cathedral Grove, a "quiet zone." They encourage visitors to turn off cell phones, talk and walk softly, and enjoy the "space for quiet reflection" among enormous old redwood trees. For an even "more peaceful experience", they recommend visiting when it's raining. Imagine how soothing that would sound!

Muir Woods National Monument

Important Vocabulary

Acoustics	How sound behaves in a space; The branch of physics concerned with the properties of sound.
Biodiversity	The variety of living things in an area, including animals, plants, fungi, and even tiny organisms like bacteria. These species work together in ecosystems to keep nature balanced and support life.
Environmental health	A part of public health that studies how people and their environment affect each other. The goal is to promote human health by keeping our communities safe and healthy.
Habitat	The natural home or environment of an animal, plant, or other organism. A person's usual or preferred surroundings.
Noise pollution	Unwanted or loud sounds in the environment that can harm people, animals, and other living things.
Soundscape	The sounds heard in a particular location, considered as a whole
Vibration	A back-and-forth movement of something that has been disturbed. It could be a solid, liquid, or wave; (Informal) The mood, feeling, or atmosphere of a person, place, or thing as others experience it.

Procedures

Step 1. What Do We Hear?

The leader will ask everyone to stay silent for 60 seconds and listen to their current location. Then, gather the group into a circle to facilitate a discussion about sound and well-being.

Ask

What sounds are you noticing? Let's go around our circle and share one or two sounds that you can identify in this location.

Step 2. Sound and Well-being

Say

All sounds travel as waves moving through a medium like air, water, or stone. How these sounds interact with objects is called acoustics – such as the way sound waves reflect off buildings or are absorbed by trees. Sound vibrations not only hit our ears, but also our bodies. Some sounds may be unwanted and called noise, but other sounds may help us feel calm and tranquil. It's important to remember that everyone has different sensitivities to sound. All our feelings are valid and it's alright not to agree how we label sounds. However, there are some sounds that most of us consider calming.

Ask

- Which sounds here help you to feel good?
- Do any of these sounds bring you positive memories?
- When you visit a park or the wilderness, what sounds do you expect to experience?
- Should we have spaces that offer us peace and tranquility?
- How can you make time in your daily life to experience sounds that help you to feel good?

Step 3. Sound and Stress

The leader should again ask everyone to stay silent and listen to their current location for another 60 seconds. They may move outside the circle for this listening exercise. Then, ask the group to re-form the circle for a discussion about sound and stress. Whenever it fits, remind the group about any noisy human-made sounds they noted during Step 1.

Say

After our first silence, we identified several sounds that were pleasing to us. This time, let's talk about the sounds we did not enjoy in the soundscape. Layers of sound are happening all the time in the outdoors. Individual sounds are easier to hear when they are not covered by other sounds. The unwanted sounds we may label as noise are usually intense, loud, and last long periods of time. They can cover up other softer sounds such as birdsong, the human voice, and sounds from the Earth like wind and water. Noise can cause stress, which affects the health of both humans and animals.

Ask

- Which sounds at this location do you find annoying?
- How do noisy sounds make you feel? Follow up question: Why?
- When you are communicating, which sounds do you use? Examples are speech, singing, tapping, clapping, whistling, etc.
- How does noise interfere with your ability to communicate? An example is a car driving by as you are trying to speak with someone nearby.
- What sounds do animals use to communicate? Examples are tweets, rumbles, squeaks, chirps, growls, howls, barks, etc.
- Do you think noise affects animals like it affects humans? Answer is Yes. If animals can't communicate to hunt, find a mate, claim territory, or build a habitat, they may leave the area.
- What are some ways that a park ranger or visitor could reduce noise pollution? Could we make it easier to hear natural sounds in this space?

Say

We've been discussing an important part of environmental health, allowing space for all the creatures of Earth to be able to communicate. The more time we have without noise pollution, the greater number of animals will be able to thrive. This can improve biodiversity. Species and organisms work together to maintain balance and support all life, like an intricate spider web. Humans are a part of this web and we have a responsibility to help our animal friends prosper.

Fun Fact

Research has found that sounds of nature help reduce stress and restore a sense of well-being. Birdsong and the sounds of water are particularly beneficial. However, not all species are always calming. People report being frightened or annoyed by squawky or screechy birds, such as crows or some owls.

Bird sounds and their contributions to perceived attention restoration and stress recovery.

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Good Vibes Field Notes

Step 1. What Do We Hear?

Ask the group to stay silent for 60 seconds and listen. Then gather everyone into a circle to facilitate the discussion.

Ask
What sounds are you noticing? Let's go around our circle and share one or two sounds that you can identify in this location.

Step 2. Sound and Well-being

Ask

- Which sounds here help you to feel good?
- Do any of these sounds bring you positive memories?
- When you visit a park or the wilderness, what sounds do you expect to experience?
- Should we have spaces that offer us peace and tranquility?
- How can you make time in your daily life to experience sounds that help you to feel good?

Step 3. Sound and Stress

Ask everyone to stay silent for another 60 seconds and listen. Then gather the group back into a circle to facilitate the discussion.

Remind the group about any noisy sounds mentioned in Step 1.

Ask

- Which sounds at this location do you find annoying?
- How do noisy sounds make you feel? Why?
- When you are communicating, which sounds do you use? Examples are speech, singing, tapping, clapping, whistling, etc.
- How does noise interfere with your ability to communicate? An example is a car driving by as you are trying to speak with someone nearby.
- What sounds do animals use to communicate? Examples are tweets, rumbles, squeaks, chirps, growls, howls, barks, etc.
- Do you think noise affects animals like it affects humans? Answer is Yes. If animals can't communicate to hunt, find a mate, claim territory, or build a habitat, they may leave the area.
- What are some ways that a park ranger or visitor could reduce noise pollution? Could we make it easier to hear natural sounds in this space?

Education Standards

Common Core

CC-SL.1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
CC-SL.2	Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
CC-SL.3	Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.
CC-SL.4	Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Florida Sunshine State Standards: Science

SC.K.N.1.2	Make observations of the natural world and know that they are descriptors collected using the five senses.
SC.K.N.1.5	Recognize that learning can come from careful observation.
SC.3.N.1.5	Recognize that scientists question, discuss, and check each other's evidence and explanations.
SC.3.N.3.1	Recognize that words in science can have different or more specific meanings than their use in everyday language (e.g., energy, cell, heat/cold, and evidence).
SC.4.N.1.1	Raise questions about the natural world, use appropriate reference materials that support understanding to obtain information, conduct both individual and team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.
SC.4.P.10.3	Investigate and explain that sound is produced by vibrating objects and that pitch depends on how fast or slow the object vibrates.
SC.5.P.10.1	Investigate and describe some basic forms of energy, including light, heat, sound, electrical, chemical, and mechanical.
SC.6.N.2.3	Recognize that scientists who make contributions to scientific knowledge come from varied backgrounds and possess diverse talents, interests, and goals.
SC.7.P.10.8	Recognize that light waves, sound waves, and other waves move at different speeds in different materials.
SC.8.N.1.6	Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations, and models to make sense of the world.

SC.912.N.1.7 Recognize the role of creativity in constructing scientific questions, methods, and explanations.

Florida Sunshine State Standards: Special Skills

SP.PK12.VI.1.2 Apply listening and auditory skills, such as discriminating sounds and associating concepts, actions, and ideas with expressive language.

SP.PK12.VI.2.3 Participate effectively in group activities, such as cooperative learning and extracurricular activities.

SP.PK12.VI.4.2 Locate school and community resources for recreation and leisure that facilitate participation by individuals who are blind or visually impaired.

SP.PK12.VI.4.3 Identify and implement adaptive strategies for recreational and leisure activities to ensure active participation.

SP.PK12.VI.5.5 Distinguish between permanent and transitory items in the environment.

SP.PK12.VI.5.6 Identify common auditory environmental stimuli and locations, such as the sound of a water fountain in the hallway and traffic sounds on roads.

SP.PK12.VI.6.1 Apply listening and auditory skills, such as discriminating sounds and associating concepts, actions, and ideas with expressive language.

SP.PK12.VI.7.4 Explain possible coping strategies for managing stressors.

SP.PK12.US.9.1 Participate in individual and group recreation/leisure activities.

SP.PK12.US.13.3 Identify common auditory environmental stimuli and locations, such as the sound of a water fountain in the hallway and traffic sounds on roads.

SP.PK12.US.13.5 Use environmental orienting techniques, such as using landmarks and tactile markers, for familiarizing areas in urban and rural settings.

SP.PK12.US.22.1 Use appropriate social and interpersonal skills and strategies to interact with peers and adults for various purposes across settings.

Florida Sunshine State Standards: Social Studies

SS.912.P.4.11 Describe the nature of attention.

SS.912.P.15.6 Explain how other environmental factors influence emotional interpretation and expression.

Standards by Educational Activity

Soundwalk
CC-SL.1
CC-SL.2
CC-SL.3
CC-SL.4
SC.K.N.1.2
SC.K.N.1.5
SC.3.N.1.5
SC.4.N.1.1
SC.6.N.2.3
SC.8.N.1.6
SC.912.N.1.7
SP.PK12.VI.1.2
SP.PK12.VI.2.3
SP.PK12.VI.4.3
SP.PK12.VI.5.5
SP.PK12.VI.5.6
SP.PK12.VI.6.1
SP.PK12.US.22.1

DIP TiPS
CC-SL.1
CC-SL.2
CC-SL.3
CC-SL.4
SC.K.N.1.2
SC.3.N.3.1
SC.4.N.1.1
SC.4.P.10.3
SC.7.P.10.8
SS.912.P.4.11
SP.PK12.VI.1.2
SP.PK12.VI.5.6
SP.PK12.VI.6.1
SP.PK12.US.13.3
SP.PK12.US.22.1

Echoes of the Past
CC-SL.1
CC-SL.2
CC-SL.3
CC-SL.4
SC.4.N.1.1
SC.5.P.10.1
SC.6.N.2.3
SP.PK12.VI.1.2
SP.PK12.VI.4.2
SP.PK12.VI.5.6
SP.PK12.VI.6.1
SP.PK12.US.13.3
SP.PK12.US.22.1

Listen Pair Share
CC-SL.1
CC-SL.2
CC-SL.3
CC-SL.4
SC.4.N.1.1
SC.4.P.10.3
SP.PK12.VI.1.2
SP.PK12.VI.4.2
SP.PK12.VI.5.6
SP.PK12.VI.6.1
SP.PK12.US.13.3
SP.PK12.US.22.1

Masking Mayhem
CC-SL.1
CC-SL.2
CC-SL.3
CC-SL.4
SC.K.N.1.2
SC.3.N.3.1
SC.4.N.1.1
SC.4.P.10.3
SC.7.P.10.8
SP.PK12.VI.1.2
SP.PK12.VI.2.3
SP.PK12.VI.4.2
SP.PK12.VI.5.6
SP.PK12.VI.6.1
SP.PK12.US.13.3
SP.PK12.US.22.1

Good Vibes
CC-SL.1
CC-SL.2
CC-SL.3
CC-SL.4
SC.4.N.1.1
SC.5.P.10.1
SC.6.N.2.3
SS.912.P.15.6
SP.PK12.VI.1.2
SP.PK12.VI.2.3
SP.PK12.VI.4.2
SP.PK12.VI.4.3
SP.PK12.VI.5.5
SP.PK12.VI.5.6
SP.PK12.VI.6.1
SP.PK12.VI.7.4
SP.PK12.US.9.1
SP.PK12.US.13.3
SP.PK12.US.13.5
SP.PK12.US.22.1