

# ANCHORAGE MUSEUM

## SUMMER

### BACKGROUND INFORMATION

Since 2018, the Anchorage Museum has partnered with schools and organizations, including the Campbell Creek Science Center, to record and collect the dynamic soundscapes of Alaska. This lesson examines the seasonal aspect of summer soundscapes and how those soundscapes are impacted by noise. This lesson plan offers an opportunity for students to examine soundscapes throughout summer break.

### STUDENTS WILL:

- Discover how to utilize our sense of hearing to make observations of the natural world
- Practice close listening
- Learn how soundscapes change over time throughout the year and during different seasons
- Use data sheets to make and record observations
- Think critically and support answers with evidence
- Examine the difference between noise and sound

### MATERIALS

**Steps 1 & 3:** Computer or tablet with internet connection

**Steps 2:** To be done away from a device at your own listening site. Students may print the appendix activity sheets found at the end of this lesson or write down the appendix questions on another sheet of paper.

### RECOMMENDED GRADE LEVEL

Eighth through twelfth

Adapt for K-12 and adult learners

### KEY TERMS

**Soundscape:** all the sounds in a particular place

**Soundscape ecology:** the science of studying soundscapes to better understand a place and the relationships between organisms and that place

**Soundscape ecologists:** scientists who study soundscape ecology

**Biophony:** sounds made by living things, but not people

**Geophony:** sounds made by the earth

**Anthrophony:** sounds made by people and machines

**Sound:** sound is vibration which moves through mediums such as air as sound waves; sound is what is heard

**Summer:** warmest season of the year in middle and high latitudes; occurs between spring and autumn

**Noise:** a sound, especially one that is loud or unpleasant, or which causes disturbance

**Sound Meter:** a measuring instrument used to assess noise or sound levels by measuring sound pressure.

### STEPS

This lesson plan provides three steps. Each is explained in detail on the next page.

**Activity 1:** Introduction to Summer Soundscapes

**Activity 2:** Noise versus sound

**Activity 3:** Noise monitoring

*This lesson plan was created with support from:*



## STEP 1

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### Introduction to Summer Soundscapes - [10 minutes]

In this step, students will consider their relationship to summer and what summer soundscapes they hear the most. Complete **Appendix A** to guide learning.

## STEP 2

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### Noise versus Sound - [15 minutes]

In this step, students will select their own outdoor listening site where they will listen carefully and examine the difference between noise and sound within the spot using **Appendix B**.

## STEP 3

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### Noise monitoring - [30 minutes]

In this step, students will select a site to monitor noise levels throughout the summer. Complete **Appendix C** to guide learning.

## EXTENSION ACTIVITIES

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### Introduction to Summer Soundscapes - [10 minutes]

This step can be repeated in multiple places during the summer to compare and contrast different soundscapes, or it can be done for different seasons using the different listening spots for each season.

### Noise versus Sound - [15 minutes]

This step can be done at various spots around the school or learning site to determine levels of noise versus sound at different parts of the school.

### Noise monitoring - [20 minutes]

This step could be expanded to study a single spot throughout the year to determine which months have the highest noise measurements. It could also be scaled down and done at a single spot several times throughout the day.

## ADDITIONAL SOUNDSCAPE ACTIVITIES

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To continue learning about soundscape ecology, engage with these Anchorage Museum lessons:

- [Introduction to Sound and Soundscapes](#)
- [Art and Sound](#)
- [Sense of Place](#)
- [Summer Soundscapes](#)

All Anchorage Museum lessons can be found on the [Educator Resource webpage](#), including more soundscape ecology activities.

Visit the [Campbell Creek Science Center's website](#) to explore another version of a sound map.



# INTRODUCTION TO SUMMER SOUNDSCAPES

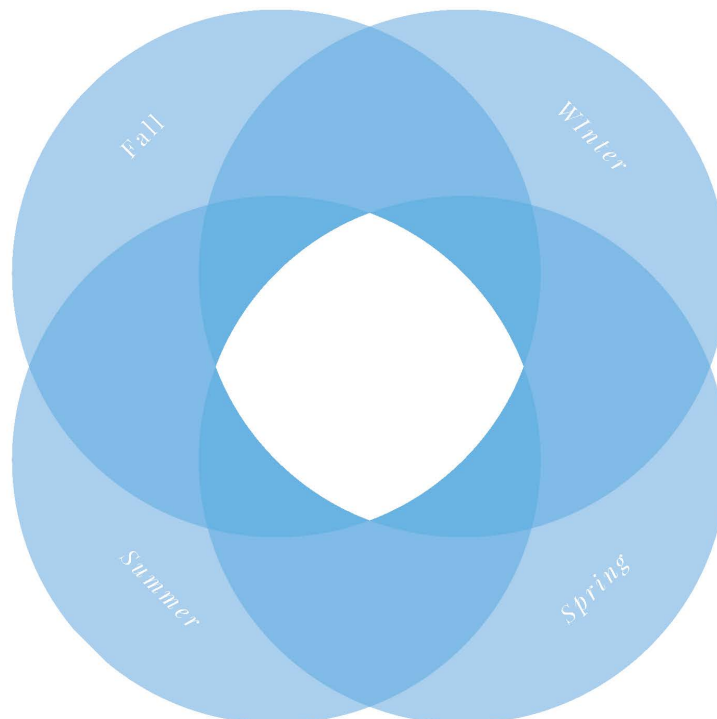
1. What defines summer for you?

*Summer is the warmest season of the year in middle and high latitudes. Summer occurs between spring and autumn. In the Northern Hemisphere summer is usually defined as the period between the summer solstice, year's longest day, and the autumnal equinox when day and night are equal in length.*

2. What outdoor place do you spend most of your time in the summer and why?

3. List the sounds you hear in that place during the summer time. If you can easily access this place, listen for five minutes and list what you hear.

4. Repeat the process from question three for the rest of the seasons in the Venn diagram below.



*A soundscape is all the sounds in a particular place. Soundscapes are unique to a specific place and time.*



## INTRODUCTION TO SUMMER SOUNDSCAPES

*Soundscapes may contain many different sounds. Scientists who study soundscapes divide sounds into three categories*

*Biophony: sounds made by living things, but not people; examples include birds and mosquitoes*

*Geophony: sounds made by the earth; examples include rain, waves, and landslides*

*Anthrophony: sounds made by people and machines; examples include laughter, footsteps, and cars*

5. Take the sounds that you listed in question three and four and sort them into the following categories.

Biophony	Geophony	Anthrophony

6. Which category was most dominate in summer?

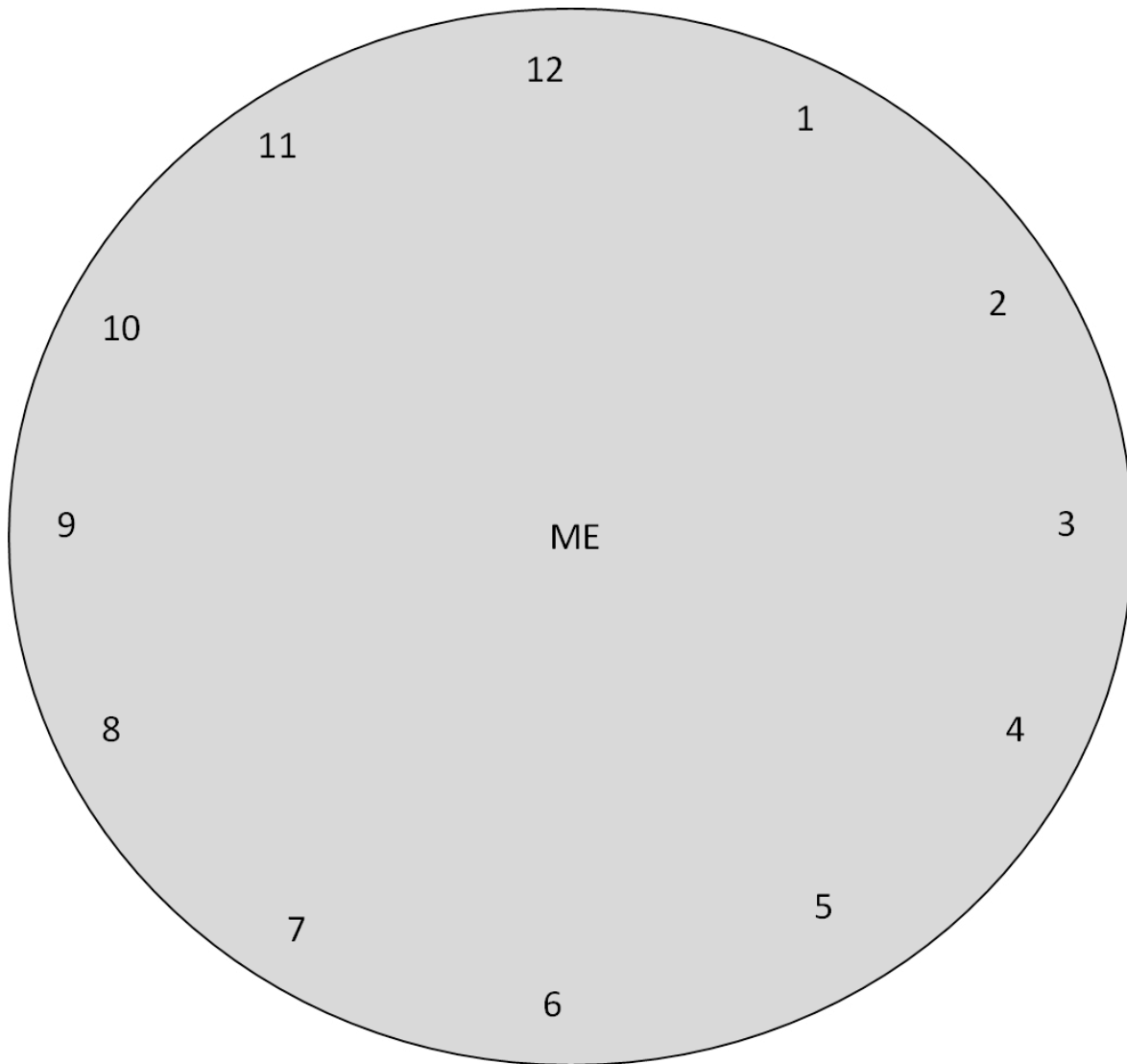
7. Why do you think that may be?

8. Which season was the most different from summer? Why?



## Noise Versus Sound

- Go to the nearest outdoor spot and create a sound map of everything you hear for at least two minutes. Imagine you are in the middle of a clock, with 12 o'clock directly in front of you. Record each sound on the map in the approximate direction and distance from which you hear the sound.



- Sort the sounds you heard into the following categories.

Noise	Sound



# Noise Versus Sound

3. Sort the sounds you listed as noise in question three into the following categories

Biophony	Geophony	Anthrophony

6. How do you define noise?

*Noise is a sound, especially one that is loud or unpleasant, or that causes disturbance.*



## Noise Monitoring

*Soundscape ecologists are people who study soundscapes. They use the sense of hearing as a way to understand a particular environment and observe how that unique soundscape may change over time. Studying soundscapes allows scientists to gain greater insight about an environment by providing information about that place they may not otherwise observe.*

*A large presence of noise in an environment is considered noise pollution. Noise pollution is unwanted or excessive sound that can have negative effects on human health and environmental quality. Noise pollution is commonly generated inside many industrial facilities and other workplaces. It also comes from highway, railway, airplane traffic, and from outdoor construction activities.*

*For this step, students will select a outdoor space to monitor for noise pollution during the summer months of June, July and August.*

*1. Select a site to monitor once a month throughout the summer. Describe the site, considering: What is around you (buildings, trees, road, other)? What are you standing on (pavement, grass, balcony, other)?*

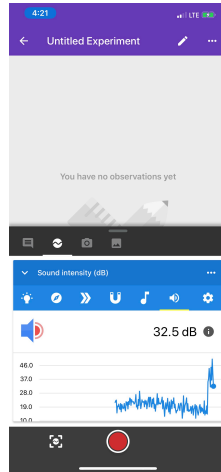
2. Complete a ten minute listen at your site and sort all of the sounds you hear into categories below. Circle sounds you consider noise.

Biophony	Geophony	Anthrophony

# Noise Monitoring

Soundscape ecologists and environmental engineers use sound meters to measure the noise pollution in an environment. A sound meter is a measuring instrument used to assess noise or sound levels by measuring sound pressure in decibels. The volume or amplitude of sound is the volume or energy of a sound wave; high amplitude means loud sounds and low amplitude means quiet sounds. Amplitude is often measured in decibels (dB).

Use a tablet or a smart phone to download the Science Journal App by Google found [here](#). Once downloaded access the sound intensity tool as shown below.



4. Measure out a 50 meter line at your site, marking every ten meters as you go. (fifty meters is approximately 66 foot steps). Using the sound intensity tool on the Science Journal App, mark the highest recording during a minute duration at each site.

- 0 meters
- 10 meters
- 20 meters
- 30 meters
- 40 meters
- 50 meters



# NOISE MONITORING

Repeat the process on the previous page once each month throughout the summer. Record findings below and graph your final results to determine which month had the loudest noise levels.

June	July	August
Date:	Date:	Date:
Time:	Time:	Time:
0 meters	0 meters	0 meters
10 meters	10 meters	10 meters
20 meters	20 meters	20 meters
30 meters	30 meters	30 meters
40 meters	40 meters	40 meters
50 meters	50 meters	50 meters

