

SOUND UNIT INTRODUCTION LESSON- 4th Grade

Goals and Objectives:

Students will be able to distinguish between different settings of sounds, to identify frequency and intensity of sound, and to interpret the details of sound recordings. Students will use critical listening to apply acoustic knowledge to the real world.

Warm Up:

The teacher will introduce the new unit (sound) and explain the lesson objectives in a way that the students can understand. Ex: "Today you will listen to different sounds and figure out what's different about where the sounds happen." Then the teacher will have the students apply prior knowledge and predict future knowledge through KWL charts. Students will complete a KWL chart with their partners through discussion and writing. They will fill out the K column (What do you know about sound?) and the W column (What do you want to know about sound?). There is only a warm-up in the beginning of the lesson before students break off into stations.

Introduction:

Each partnership will share one fact from their K column with the class. The teacher will introduce the sound unit by going over the objectives of the day. Next, the teacher will pass out the Sound Exploration worksheet and tell the students about their partner activity of the day, Sound Exploration Stations. The teacher will define the following vocabulary while the students fill the information in their Sound Exploration chart: *sound, volume, sound wave, frequency, intensity, vibration, pitch*.

Activity:

The teachers will briefly go over what each Sound Exploration Station is about. Ex: "At station 1, you will be sound detectives and answer questions about the sounds you hear." Clarify that a set of directions is placed at each station. With the same partner, students will be dismissed to these stations to complete the activities. They may move freely between stations as they finish and see one open. The teachers will move between stations and answer questions during the activities. Students should need about 75 minutes to complete all of the stations, which excludes the warm-up and closing.

Closing: (5 min)

Students will complete the L column of their chart. The teacher will collect the charts and display them throughout the class for the duration of the unit.

Station 1: Sound Detectives

Goals and Objectives:

Students will be able to listen critically and identify certain characteristics of sound that can help people pinpoint some aspects of the setting of a recorded sound. These aspects include whether or not the sound is recorded indoors or outdoors and whether or not the sound was recorded naturally or altered by computer editing. There are also questions to have students think about the different sounds they hear and if any of these sounds make the environment in the recording sound familiar to them. By the end of the lesson, students will have the skills to become “sound detectives”; they will be able to make several inferences about the nature of a recording just by using their ears. The activity should take about 10 minutes.

Materials:

- Sound Exploration worksheet
- Pencils
- Computers (Soundcloud)
- Headphones
- Soundcloud Link: <https://soundcloud.com/nicole-frankel-714074214/station-1>

Procedure:

1. The students will use the laptop to listen to the sound on Soundcloud.
2. They will answer the following questions based on the sound:
 - a) What sounds do you hear?
 - b) Do you think this recording was taken inside or outside?
 - c) How would you describe the sounds in this space?
 - d) Does this space sound like a space that you have been in before?
 - e) Do these sounds seem natural, or do you think people could have used a computer to edit these sounds?
3. They will discuss the answers and share their “detective work” with their partner once they write their responses. Provide guiding questions such as *Do you hear an echo?* and *Do you hear any sounds that do not belong indoors?*
4. When the teacher checks in with this station, she should explain the answers that would be expected based on the sound, but emphasize that their perception of the sound isn’t wrong.

Station 2: Comparing Frequency and Intensity

Goals and Objectives:

Students will be able to define frequency and intensity. Once these terms are defined, students will be able to compare and contrast frequency and intensity in different sound recordings. The activity should take about 8 minutes.

Materials:

- Sound Exploration worksheet
- Pencils
- Laptops (Soundcloud)
- Headphones
- Soundcloud links:
<https://soundcloud.com/nicole-frankel-714074214/station-2-pair-4>
<https://soundcloud.com/nicole-frankel-714074214/station-2-pair-2>
<https://soundcloud.com/nicole-frankel-714074214/station-2-pair-3>

Procedure:

1. The students will listen to a pair of sounds on Soundcloud.
2. Responding on their worksheet, they will determine which sound has the higher frequency and intensity, using their definitions.
3. They will repeat this with two more pairs of sounds.

Station 3: Vibration Exploration

Goals and Objectives:

Students will be able to define vibration and identify real world objects that vibrate.
Students will know how to briefly explain the relationship between vibration and sound.
The activity should take around 15 minutes.

Materials:

- Sound Exploration worksheet
- Pencils
- Laptop (Youtube video) <https://www.youtube.com/watch?v=SYMvOxIsES4> 1:00-1:10
- Blank sheets of paper
- Crayons
- Ukulele
- Headphones

Procedure:

1. Present the ukulele. Ask students if they know what the instrument is. If not, tell them.
2. Demonstrate strumming the ukulele and gently resting your hand on the strings right after strumming. Ask students what they feel.
3. Explain the concept of vibration and tell them how vibration creates sound.
4. Have the students view the video of cornstarch and water vibrating on a speaker.
5. The students will take ~8 minutes to draw and color things that vibrate.
6. Ask students to share their drawings with the group and have students discuss the sounds that their drawings would make if they were real.

Station 4: Sound Associations

Goals and Objectives:

Students will be able to recall sounds that they have experienced in a variety of environments in order to associate sound memories.

Students will be able to interpret sounds to determine location and situation.
This activity should take about 10 minutes.

Materials:

- Sound Exploration worksheet
- Pencils

Procedure:

1. Students will answer the following question on their worksheets: What do you remember hearing today? Write out a list.
2. Students will answer the following question on their worksheets: What does your community sound like?
3. Students will answer the following question on their worksheets: What do you think New York City sounds like?
4. What do you think the Amazon Rainforest sounds like?
5. Students will complete the following activity with a partner:
 - a. Choose a sound that you heard today. Think about it in your head. Where were you? What were you doing?
 - b. As best as you can, make that sound and have your partner guess what it is.
 - c. If they guess the sound, next have them guess where you were and what you were doing using yes or no questions.
 - d. Switch.

Station 5: Listening Interpretation

Goals and Objectives:

Students will interpret sounds to evaluate the location and type of sound. Students will use prior knowledge to examine various sounds and identify their origins. This activity should take about 7 minutes.

Materials:

- Sound Exploration worksheet
- Pencils
- Laptop
- PowerPoint presentation (with sounds and pictures)
- Headphones

Procedures:

1. Students will use the PowerPoint presentation to listen to the sound on the first slide (kitchen sounds).
2. Using this sound, students will answer the following questions on their worksheets:
 - a. What do you think of when you hear this?
 - b. Where do you think you are?
 - c. How many different sounds do you hear?
3. After answering these questions, students will click to the next slide to see a picture representation of the sound they listened to.
4. Students will click to the next slide to listen to a new sound (rainforest), and then repeat steps 2 and 3.
5. Students will repeat for the last sound (train).

Station 6: Slinky Sound Waves

Goals and Objectives:

Students will compare high pitch and low pitch sound frequencies by watching a video, imitating the waves, and drawing pictures. Students will experiment with sound wave representations through Slinky play. This activity should take around 10 minutes.

Materials:

- Sound Exploration worksheet
- Pencils

- Laptop
- Slinky
- Headphones
- StudyJams Sound video <http://studyjams.scholastic.com/studyjams/jams/science/energy-light-sound/sound.htm>

Procedure:

1. Students will watch StudyJams “Sound.”
2. Then, on their worksheet, they will draw pictures of what the sound waves look like.
3. With their partner, students will use a slinky to imitate high pitch and low pitch sounds.
 - a. Two people hold the ends of a slinky and walk 5 feet apart.
 - b. One person moves the slinky end up and down while the other person holds their end steady.
 - c. Watch the slinky - how many waves form in between the two people?
 - d. What happens if you go faster or slower? How many ways can you make the wave travel?

Station 7: Sound Walk

Goals and Objectives:

Students will be able to identify and distinguish different sounds during a listening activity. Students will observe humans’ effects on soundscape and their own personal effects. Students will apply the information they have learned about the natural environment to analyze individualistic effect. This activity should take around 13-15 minutes.

Materials:

- Sound Exploration worksheet
- Pencils

Procedure:

1. The teacher will take a small group of students on a sound walk. Students should be told to focus on listening.
2. While indoors, students will listen to and write down the sounds they can identify.
3. While outdoors, students will listen to and write down the sounds they can identify.
4. Once the students return to the classroom, students will reflect on their experience and answer the following questions:
What sounds did you make? How did that affect everything around you?

References

1. <http://exploresound.org/>
2. <http://www.acousticecology.org/edu/educurriculum.html>
3. <http://www.kimsoleskiward.com/pdfs/Musical%20Soundscape%20Article%20Summer%202009.pdf>
4. <http://studyjams.scholastic.com/studyjams/jams/science/energy-light-sound/sound.htm>
5. <http://www.sciencekids.co.nz/sciencefacts/sound.html>
6. *An Introduction to Acoustic Ecology* (Wrightson)
7. *The Music of the Environment* (Schafer)
8. *Hear Where We Are* (Stocker)
9. *100 Exercises in Listening and Soundmaking* (Schafer)

SOUND EXPLORATION

| Vocabulary | | Station 1 |
|---|------------|--|
| Word | Definition | <p>What sounds do you hear?</p> <p>Do you think this recording was taken inside or outside?</p> <p>How would you describe the sounds in this space?</p> <p>Does this space sound like a space that you have been in before?</p> <p>Do these sounds seem natural, or do you think people could have used a computer to edit these sounds?</p> |
| Sound | | |
| Volume | | |
| Sound Wave | | |
| Frequency | | |
| Intensity | | |
| Vibration | | |
| Pitch | | |
| Station 2 | | Station 3 |
| <p>Listen to each pair of sounds. For each pair, decide which sound has the HIGHEST frequency and then decide which sound has the HIGHEST intensity. Circle the sounds.</p> <p><u>Pair #1</u></p> <p>Highest Frequency: Sound 1 Sound 2</p> <p>Highest Intensity: Sound 1 Sound 2</p> <p><u>Pair #2</u></p> <p>Highest Frequency: Sound 1 Sound 2</p> <p>Highest Intensity: Sound 1 Sound 2</p> <p><u>Pair #3</u></p> <p>Highest Frequency: Sound 1 Sound 2</p> | | |

| | |
|---|--|
| <p>Highest Intensity: Sound 1 Sound 2</p> | |
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| <p style="text-align: center;">Station 4</p> <p>What do you remember hearing today? Write out a list.</p> <p>What does your community sound like?</p> <p>What do you think New York City sounds like?</p> <p>What do you think the Amazon Rainforest sounds like?</p> <p>Choose a sound that you heard today. Where were you? What were you doing? As best as you can, make that sound and have your partner guess what it is. If they guess the sound, next have them guess where you were and what you were doing using yes or no questions. Then switch.</p> | <p style="text-align: center;">Station 5</p> <p><i>Sound 1:</i> What do you think of when you hear this?</p> <p>Where do you think you are?</p> <p>How many different sounds do you hear?</p> <p><i>Sound 2:</i> What do you think of when you hear this?</p> <p>Where do you think you are?</p> <p>How many different sounds do you hear?</p> <p><i>Sound 3:</i> What do you think of when you hear this?</p> <p>Where do you think you are?</p> <p>How many different sounds do you hear?</p> |
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Station 6

Draw the sound wave of a high pitch sound, like birds chirping.

Draw the sound wave of a low pitch sound, like a tuba.

Station 7

Write down some sounds that you hear inside:

Write down some sounds that you hear outside:

What sounds did you make? How did that affect everything around you?