

## Lesson Four: Bio-Music with Birds

Lesson One: Introduction to Biomimicry provides the foundation for the remaining five lessons in the Biomimicry unit. Bio-Music with Birds is the music lesson of the unit.

### Objectives

1. Students will be able to perform a short melody as a duet (with a bird).
2. Students will be able to use elements of music (dynamics, rhythm, tempo, pitch, tessitura, tone, form and mnemonic) to describe how their own melody interacts with another melody.

### Preparation

Preview Bio-Music With Birds and Science Takes Wing PowerPoints. Decide whether you will browse websites and/or YouTube spectrograms of bird calls to show your students. Decide whether you will ask small groups to work together to complete the bird song test-practice on Day Two.

### Resources and Supplies

[Bio-Music with Birds PowerPoint](#)

[Science Takes Wing PowerPoint](#) (From the ASU Ask a Biologist webpage "Birds and their Songs")  
<https://askbiologist.asu.edu/birding-educational-tools>

[Science Takes Wing II PowerPoint](#) (introduces bird calls with embedded recordings and a culminating quiz)

[Bird Call Recordings and Student Bio-Music Samples](#) (From Kyrene de La Poloma Elementary School Arts Integration website. These samples are slower for easier listening.)  
<http://az01001083.schoolwires.net/Page/40767>

computers with speakers for small groups in the class

[Bird Call Grid worksheets pdf](#)

[Bird Call Spectrogram-Like Drawings for Arizona Birds handout pdf](#)

[Music Reflection worksheet pdf](#)

soprano recorders

audio recorder

OPTIONAL: Websites or YouTube videos with spectrograms of bird calls

### Activities

#### DAY ONE

Review: Review the theme in life that "Plants and animals have developed amazing ways to solve problems so they can live and thrive", the theme in science that "Scientists identify problems in today's world and explore sustainable solutions already working in the lives of plants and animals" and the theme in the arts that "Visual, performing and literary artists fascinated by the amazing abilities of plants and animals find exciting problems for their own creative work."

Review the unit's key questions:

What inspiration can I find in nature for my own music?

What elements of music will I use (dynamics, rhythm, tempo, pitch, tessitura, tone, form and mnemonic) in my melody?

Introduction: Display The Bio-Music With Birds PowerPoint slides 1-9 to:

- Explain how 1) people enjoy listening to birds, 2) scientists study how birds communicate and 3) musicians get inspiration for their music from bird calls (slides 1 & 2).
- Ask students to share their experience with birds -- where they see and hear birds and what they imagine birds might be communicating with each other (slides 3 & 4).

- Illustrate the challenge of inter-species communication (slides 5-7).
- Introduce examples of inter-species music making and explain that students will be creating a melody to play as a duet with a bird (slides 7-9).

Review and Guided Practice: Display Bio-Music With Birds PowerPoint slides 10-12 to:

- Review elements of music (slide 10).
- Distribute Bird Call Grid worksheets and show an example of a student's completed grid (slide 12).
- Define a spectrogram and show a student's spectrogram-like drawing that shows the length and pitch of sounds in a bird call. Students will practice using lines to describe bird calls in the last column on their Bird Call Grid worksheets and later choose one bird call to describe with a spectrogram-like drawing (slide 12).

Divide students into small groups each with a computer with speakers. Direct them to open to Science Takes Wing PowerPoint leading them through slides 1-8 to:

- Introduce bird calls (slides 1-4).
- Show ten common Arizona birds (slide 5).
- Explain that students will be describing the calls of particular birds (slide 6).
- Play red-tailed hawk call and practice identifying the call with the sample quiz (slides 7 & 8).
- Direct groups to listen several times to all ten 10-second birdcalls, then discuss and record descriptions on their Bird Call Grid worksheets (slides 9-19). NOTE: You may wish to play slowed-down bird call recordings on Kyrene de La Poloma Arts Integration website -- which are easier to describe.

## DAY TWO

Assemble students in the same small groups as Day One making sure they have their completed Bird Call Grid worksheets. Provide each group with a computer with speakers.

OPTIONAL: Review and Listening Practice-Test: Display Science Takes Wing PowerPoint slides 20-31:

- Direct small groups to work together consulting their Bird Call Grids to identify bird calls writing down answers as you play each call (slides 20-30).
- Ask groups to check their answers (slide 31).

Ask students to review their Bird Call Grid worksheets and choose one bird to create a melody and perform a duet with. Group students according to the bird they have chosen.

Remind students that spectrograms are lines representing sound that show how long sounds are and how they go up and down in pitch. Ask students to compare the lines they drew in the last column of their Bird Call Grid worksheet (Form: pattern -- Same/Different).

Refined Listening: Distribute Bird Call Spectrogram-Like Drawings for Arizona Birds handouts. Play the ten Arizona bird songs on the Kyrene de La Poloma Arts Integration website (choose 60% or 100% speed) asking them to listen for how the spectrogram-like drawings show the duration and pitch of each bird's call. Next, provide each student with paper asking them to write their name and their bird's name on the paper and then draw their own spectrogram-like drawing to show how the bird call sounds. Finally, you might want to ask students to check their drawings by tracing their lines as they listen one more time to the bird call.

Remind students that they will be collaborating, or working individually, to create their own musical phrase to play on a recorder as a duet with a recording of the bird they selected.

## DAY THREE

Final Assignment and Work Time: Display Bio-Music With Birds PowerPoint slides 13-24 to:

- Review basics of playing soprano recorder (slide 13).
- Present expectations for final assignment (slide 14).
- Review choices of musical elements for students' short melodies (slides 16-22).
- Ask students to consider how they might write down their melodies so they can remember them when they perform with their bird recording in the next class (slide 23 & 24).

## DAY FOUR

Play each bird call while recording each student's (or recording collaborating group's) improvisational duet using the melody they created.

Distribute Musical Reflection Worksheets.

Play back students duets (perhaps on a later day).

Ask students to identify musical choices they made as they created their melody and share them with the class.

### **Art Vocabulary**

dynamics

rhythm

tempo

pitch

tessitura

tone

form

mnemonic

duet

melody

### **Other Vocabulary**

species

inter-species

spectrogram

### **Extension Ideas**

Read the Kyrene de la Paloma Elementary School Biomimicry Report for ideas about how to collaborate with arts teachers and classroom teachers and perhaps other community organizations, such as an art center, university and/or wildlife rescue group.

Consider introducing students to musicians inspired by birds, such as Sergei Prokofiev's *Peter and the Wolf* and/or Camille Saint-Saens' *Carnival of the Animals*.

### **Assessment Guides**

OBJECTIVE 1. Students will be able to perform a short melody as a duet (with a bird).

Exceeds Expectations: Recorder and bird sounds interrelate musically AND the recorder melody effectively uses several different musical elements.

Meets Expectations: Recorder and bird sounds have some relationship AND the recorder melody uses several different musical elements.

Approaches Expectations: Recorder and bird sounds have some relationship OR the recorder melody uses several different musical elements.

Fails to Meet Expectations: Duet includes several recorder notes.

OBJECTIVE 2: Students will be able to use elements of music (dynamics, rhythm, tempo, pitch, tessitura, tone, form and mnemonic) to describe how their own melody interacts with another melody.

Exceeds Expectations: Student identifies bird in duet and accurately explains 4 or 5 choices of musical elements and relationships between student's and bird's sound.

Meets Expectations: Student identifies bird in duet and accurately explains at least 3 choices of musical elements and relationships between student's and bird's sound.

Approaches Expectations: Student identifies bird in duet and accurately explains at least 2 choices of musical element and at least one relationship between student's and bird's sound.

Fails to Meet Expectations: Student identifies bird in duet and explains at least one choice of musical element or relationship between student's and bird's sound.