

# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, and Composition



### FIELD EXPERIENCE LEARNING PACKAGE

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# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

### Introduction

What is music? How is it detected and how are we affected by its variations? The acoustic ecology of human experience has changed dramatically since the Industrial Revolution. During the Original Orchestra curricula, students will learn about the science behind sound, and explore the impact that natural and human made sound have on our hearing and our emotions. By employing active listening and creativity, students will learn about beat and rhythm, and create music using instruments made from natural objects as well as drums. They will explore music from a Tla'amin cultural perspective, learning Tla'amin songs alongside the opportunity to make a rattle. Finally, students will hone their musical understanding and mindful listening by learning to identify common birds by ear. This inter-curricular hands-on series of lessons will help students to become composers in an original orchestra, exploring their senses and emotions through nature's music.

### How to Use this Resource

The Original Orchestra Curriculum Package has 3 Components:

Part 1. Classroom Beginnings: Recommended for use in the classroom prior to the Field Experience.

Part 2. The Original Orchestra Field Experience Curriculum: A facilitated curricular experience.

Part 3. Classroom Culminations: Recommended for use in the classroom following the Field Experience.

### Original Orchestra Grade 3: Content & Curricular Competencies

Social Studies	Diverse characteristics of communities and cultures in Canada and around the world, including at least one Canadian First Peoples community and culture (i.e. Tla'Amin)	Explain why people, events, or places are significant to various individuals and groups  Sequence objects, images, and events, or explain why some aspects change and others stay the same  Explain why people's beliefs, values, worldviews, experiences, and roles give them different perspectives on people, places or issues
Arts Education	Students will know a variety of local works of art and artistic traditions from [Tla'Amin]  Students will know traditional and contemporary Aboriginal arts and arts-making processes  Students will know processes, materials, technologies, tools, and techniques to support arts activities  Students will know music: beat/pulse, rhythm, tempo, pitch, dynamics, form	Students will:  Explore elements, processes, materials, movements, technologies, tools, and techniques of the arts  Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play  Explore personal experience, community, and culture through arts activities
Career Education	Personal Development: Risk taking and its role in self-exploration  Connection to community: cultural and social awareness	Work respectfully with others to achieve common goals  Share ideas, information, personal feelings, and knowledge with others

# Original Orchestra Grade 3

## Classroom Beginnings: The Science of Sound, Found Sounds, and Composition

### About the Original Orchestra Classroom Beginnings

The Original Orchestra Classroom Beginnings Learning Package will introduce the science of sounds, following by an interactive exploration of found sounds. Thereafter, students will have the opportunity to create original compositions using found sounds. Finally, students will explore an introduction to the acoustic ecology of the built versus natural environment.

### Lessons in this Resource

Lesson 1: The Science of Sound (Source: PBS Learning)

([https://www.pbslearningmedia.org/resource/phy03.sci.phys.howmove.lp\\_sound/sound-vibrations/](https://www.pbslearningmedia.org/resource/phy03.sci.phys.howmove.lp_sound/sound-vibrations/))

Lesson 2: The Found Sounds Interactive Box

Lesson 3: Beat versus Rhythm

Lesson 4: Original Composition

Lesson 5: Acoustic Ecology

### Lesson 1: The Science of Sound

#### Overview

This lesson is designed to review grade 1 science content related to vibrations and how they are responsible for the sounds we hear. Additionally, they learn that sound vibrations can travel through different mediums. Students experience vibrations using several of their senses: They feel the vibrations in their throat as they hum music, and on their lips as they play their straw kazoo. They see that when a ruler is struck, it vibrates, producing a sound. Drums are also used to show vibrations, as students watch grains of rice bouncing on the surface of the drum after it has been hit, and a laser pointer creates a laser show in the classroom when reflected off a vibrating mirror. Finally, students design a test that uses their sense of hearing to judge the effectiveness of different solids to transmit sound vibrations.

#### Goals

- Define the word *vibration*
- Show that vibrations make sound
- Recognize that vibrations can be changed to alter the pitch of a sound
- Determine that sound travels through solids as well as gases (air)

**Time:** One 60-minute block and one 45-minute block

#### Multimedia Resources

- [Sound and Solids: Visualizing Vibrations](#) QuickTime Video
- [Understanding Vibration and Pitch](#) QuickTime Video
- [Pitch: Straw Kazoo](#) QuickTime Video
- [Pitch: Straw Kazoo](#) handout (PDF)
- [Hana's Japanese Drums](#) QuickTime Video

# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

### Lesson 1: The Science of Sound (continued)

#### Materials

- plastic drinking straws
- scissors
- metal cans (variety of sizes: coffee cans, soup cans, cat food cans), clean and opened at both ends with a safe-edge-type can opener that produces smooth edges
- large balloons (good quality)
- several different instruments (bell, triangle, xylophone, drum)
- chart paper
- index cards
- rulers
- yardsticks (optional)
- chopsticks or pencils (for drumsticks)
- grains of rice
- portable radio/CD player with deep base capability
- small mirror
- laser pointer

#### Before the Lesson

- Depending on the skill level of your students, you may want to make the straw kazoos for them. Follow the instructions in the [Pitch: Straw Kazoo](#) handout. If you decide to have students make their own, make copies of this handout for distribution.
- Make a demonstration drum, as follows: Open and clean the cans. Cut off the neck of a balloon. Stretch the body of the balloon tightly over one end of a can. If students are unable to do this themselves, make a class set for them. (Note that if you blow through the cut-off neck of a balloon, you can make a "raspberry" sound and feel the vibrations in your lips.)

#### Procedure

##### Part I: Introduction to Vibration

1. As a pre-assessment tool, and to activate prior knowledge, ask students:
  - How are sounds made?
  - How does sound get from the source (say, the teacher's mouth) to your ears?

# Original Orchestra Grade 3

## Classroom Beginnings: The Science of Sound, Found Sounds, and Composition

### Lesson 1: The Science of Sound

#### Procedure: Part 1 (continued)

Make sounds with several different instruments. For example, ring a bell or strike a triangle, xylophone, or drum. Ask students if they can see these instruments vibrating. Ask them how the sounds get from the instruments to their ears. Record their ideas on chart paper.

2. Introduce the word *vibration* and define it: a rapid back-and-forth movement. Demonstrate vibrations by blowing air through your lips and making "car sounds" or a "horse snort". Then show the [Sound and Solids: Visualizing Vibrations](#) video. After, ask students if they could see the vibrations in the water.

3. Show the [Understanding Vibration and Pitch](#) video. Then ask students to think of other things that vibrate (washing machines, toys, pagers, car engines, and so on). Have them touch their throat with the tips of their fingers and hum (or sing a song together). Ask them if they can guess how the humming sound is made. They should be able to feel their larynx vibrating. Tell them that the vibrations are what make the sounds. Next, ask students what other sounds they can make. Have them choose one.

- Does the sound have a high or low pitch?
- What is the volume of the sound -- is it loud or soft?

4. Show the [Pitch: Straw Kazoo](#) video. Then have students play their own straw kazoots (either made by you or by your students, using the instructions in the [Pitch: Straw Kazoo](#) (PDF) handout.) Ask students if they can feel the vibrations on their lips as they play the kazoo. Then ask them to think of words that describe the vibrations. Distribute several index cards to each student, and tell students to write one descriptive word per index card (or record them yourself if they are pre-literate). Then, as a class, arrange the words to make a vibration poem.

5. Demonstrate sound vibrations by placing a ruler on the edge of a desk, such that about eight inches of it hangs over the side. Place one hand on the four inches that remain on the desk, to hold the ruler securely. With your other hand, whack the end of the ruler that is hanging off of the desk. The ruler will vibrate up and down and produce a low sound.

Tell students to try this themselves. But before they get started, ask if they can think of a way to make the sound higher (demonstrate with your voice the difference between low pitch and high pitch). Take suggestions from students, but don't give away the answer; let them experiment with the rulers. After five minutes or so, collect the rulers and ask what they discovered (shortening the amount of ruler that hangs off of the desk causes the ruler to vibrate faster when it is struck, thus raising the pitch). Ask students what they think will happen if they use a yardstick instead of a ruler. Try it (optional).

# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

### Lesson 1: The Science of Sound

#### Procedure Part II: Visualizing Vibrations

1. Using the drum made earlier from a can and balloon, beat the drumhead (stretched balloon) with a drumstick (a chopstick or the eraser end of a pencil). Ask students if they see any vibrations (they won't). Then ask if they can hear them (they will). Explain that although it is hard to see, the drumhead is vibrating. Second graders will likely be able to make the connection between the sounds produced by their vibrating throats and rulers, and the sound produced by the vibrating drum. But before telling students that vibrations from the drumhead travel through the air to their ears, you might ask them for their ideas first.
2. Next, demonstrate three ways in which your students will be able to visualize vibrations:
  - Put a few grains of rice on the drum and gently tap the drum with a drumstick. The vibrating drumhead will cause the rice to bounce. Next, speak loudly right next to the drum. Vibrations will travel from your mouth, through the air, and through the drumhead, once again causing the rice grains to bounce.
  - Place a drum on the speaker of a portable radio/CD player. You may need to tip the player so that the speaker faces up. Put some rice on the drumhead and ask students to predict what will happen when you turn the radio on. When you turn on the radio, the vibrations from the speaker will travel through the air (and the sides of the drum), to the surface of the drum, causing the drumhead to vibrate and the rice to bounce.
  - Turn off the radio and put a small mirror (reflective side up) on the surface of the drum. Turn off the classroom lights. Direct a laser pointer at the mirror, such that it reflects the laser beam onto the ceiling. Ask students what they think will happen to the light spot on the ceiling when you turn on the radio. Then turn on the radio. As the music plays, the light spot will bounce around on the ceiling. Explain that the vibrations from the radio caused the mirror to vibrate, which in turn caused the reflection of the laser beam to bounce around. Have students place their hands on the speaker as the music plays. They will be able to feel the vibrations.
3. If your students have the skills to make their own drums, then let them do so. If not, hand out pre-made drums for them to play. Also, hand out drumsticks and grains of rice for them to bounce on the drumhead. Students may notice that different drums produce different sounds. Some drums may be higher or lower in pitch. Remind them of the ruler experiment, and explain that, if all other variables are equal, the size of the drum is related to the pitch of the sound it makes, just as the length of the ruler was related to pitch. If students are making their own drums, you can challenge some to make a drum with a very low sound, or a very high sound.
4. Show the [Hana's Japanese Drums](#) video. Challenge students to use the drums to create their own music, just like Hana does. Ask them to arrange the cans in order from highest pitch to lowest.
5. Optional: Make a guitar from a tissue box and rubber bands. You can either make one for the class or ask teams of students to make their own. Follow the [Pitch: Making Guitars](#) activity instructions. Students' concept of vibrations will be reinforced when they see the guitar strings (rubber bands) vibrating as the guitar is played. Also have students watch the [Kid Musician: Mexico's Guitar Town](#) video to see real musical instruments in action.

# Original Orchestra Grade 3

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## Classroom Beginnings: The Science of Sound, Found Sounds, and Composition

### Lesson 1: The Science of Sound

#### **Closing: Check for Understanding**

Using a can-and-balloon drum (the larger the better), ask the students how you can get the drum to make a really loud sound. Then tap it hard with a drumstick. Ask them how you can create a quiet sound. Then tap it lightly. Challenge them to get their drums to make virtually no sound at all no matter how hard or lightly they tap it. Once they have accomplished this, ask them to explain how they did it. (Some students may put their fingers on the balloon to stop the vibrations; some may stuff something into the cavity of the drum -- like paper or cloth -- also limiting the vibrations.) They should be able to explain that vibrations make sound, and that limiting the vibrations will limit the sound.

Revisit the answers to the questions you asked in the introduction. Ask students to comment on their accuracy.

# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

### Lesson 2: The Found Sounds Interactive Box

#### Background

Exploring Found Sounds can be an interesting or engaging subject for both music and science class. The following worksheets are designed to be used in conjunction with a Found Sounds box.

#### Time:

**Materials:** For consideration in your Found Sounds Box

#### Strike

Lids from coffee cans, spray cans, etc.  
Hairdryer Attachments  
Toilet Paper Rolls  
Small Plastic Cups  
Spoons  
Chopsticks  
Straws  
Keys  
Funnels  
Stapler  
Plastic Eggs  
Pens/Pencils  
Phone Case  
Small Pans  
Plates  
Balls: Golf, Whiffle, Tennis  
Eyeglass Case  
Soap Box  
Sea Shells  
Stick or Twig  
Rubber Bands

#### Shake

Tic Tacs  
Unopened cups of Soup  
Bottles of cupcake Sprinkles  
Box of Toothpicks  
Unopened Slat Shaker  
Box of Pasta  
Baby Rattle  
Box of Paper Clips  
Plastic Containers of Chicklets or Thrills Gum

#### Scrape

Cheese graters  
Beaded Necklaces  
Zesters  
Scrub Brushes  
Toothbrushes  
Combs  
Cooling Rack  
Sand Paper

#### Procedure

1. To begin with, you will need to collect items that students can explore at a Found Sounds Station. When considering items to include, consider a variety of items that students can shake, strike, or scrape.
2. Provide all students with time to rotate through the Found Sounds Box. The Found Sounds Box can be used independently as a classroom station or a teacher facilitated lesson can be implemented with the worksheets as the framework for the lesson.
3. Worksheets below include:
  - a. Strike/Shake/Scrape
  - b. Pitched / Unpitched
  - c. Original Instrument



# Original Orchestra Grade 3

Classroom Beginnings: The Science of Sound, Found Sounds, and Composition

Name \_\_\_\_\_

## Strike/Shake/Scrape

Directions: After experimenting with the Found Sound objects, decide which objects make a sound by striking, shaking, or scraping. Write those answers down.

**Strike**

**Shake**

**Scrape**

# Original Orchestra Grade 2

Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

Name \_\_\_\_\_

## Pitched/Unpitched

Directions: After experimenting with the Found Sound objects, decide which objects have a pitch and which objects do not have a pitch. Write those answers down.

**Pitched**

**Unpitched**

# Original Orchestra Grade 3

Classroom Beginnings: The Science of Sound, Found Sounds, and Composition

**Name** \_\_\_\_\_

## Original Instrument

Directions: Use the items in the Found Sounds Box to make a new instrument. This new instrument should include 3 items from the box. Tape, glue, rubber bands, or paper clips can be used to attach all the pieces.

**What objects did you choose?**

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**How do you play this instrument?**


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**In the space below, sketch your instrument?**



# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

### Lesson 3: Beat Versus Rhythm

#### Background

By grade 2, students typically have mastered the concept of keeping a steady beat. However, increasingly challenging is understanding the difference between beat and rhythm.

Simply put, the beat is the underlying steady pulse of a song. The rhythm is the way the words go which can be fast or slow, but the beat always stays the same.

**Materials:** None

**Time:** 30 Minutes

#### Procedure

1. Introduce Familiar Rhymes (Baa Baa Blacksheep & Hickory Dickory Dock). Speak the rhyme for your students in a slightly more expressive, sing-song voice than you would normally use to speak. As you speak, keep the beat with your students by patting on your lap.
2. Speak Together and Keep the Beat: Once the rhyme has been chanted several times, your students can join in with you. It's important that they are very comfortable with the chant. It's okay to take some extra time making sure they are comfortable speaking it by themselves.
3. Speak Together and Catch the Words: Invite your students to put their hands right next to their mouths and "catch the words" as they come out. As the two of you clap to catch every single syllable in the rhyme, you will be clapping out the rhythm to the song.
4. Reinforce this concept by listening to familiar different musical selections. Invite students to walk to the beat and then try again, walking to the rhythm or words.

# Original Orchestra Grade 3

## Classroom Beginnings: The Science of Sound, Found Sounds, and Composition

### Lesson 4: Original Composition

#### Objective

Students will learn some basic musical notation and apply it through the composition of an ostinato using body percussion sounds.

#### Materials

- Copies of **Compose and Perform** worksheet (below)
- Mini Kitkat Bars

**Time:** 2, 30 Minute Blocks

#### Procedure

##### Part 1: Kitt Katt Musical Notation

#### Materials

- 1 Package of Halloween Sized KitKat Bars.

#### Procedure

1. Give every student a KitKat bar.
2. Start by talking about eating the whole candy bar themselves, then what they would do if a friend came along and wanted some (answer – split it in half)
3. The students are then asked to split their KitKats in half.
4. Illustrate that you don't have 2 new candy bars (quarter notes or TA), but 2 halves of the same old candy bar (eighth notes or TITI); that each one is smaller (shorter/quicker); each 8th note gets half of a candy bar (beat) etc.

# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

### Lesson 4: Original Composition (continued)

#### Procedure (continued)

#### Part 2: Compose and Play

#### Procedure

1. Revisit the Kitkat Lesson. Review TA and TITI.
2. Hand out copies of the worksheet “Compose and Play.”
3. Model clapping and saying the rhythm for the top row of notes: “TA TA TITI TA.”
4. Have the students repeat this pattern.
5. Then proceed to the next two written examples. Solicit answers from the class. When a correct answer is given, have the whole class copy the correct answer.
6. After all three lines have been read aloud, ask the students how many beats there are all together, on the top line (Answer – 4). Revisit with students the concept that quarter notes equal 1 whole beat, while eighth notes equal a half beat.
7. Ask students how many beats there are all together on the next 2 lines (Answer – 4).
8. Point out to students that we’ve been clapping the rhythm. Ask them for other ways they can use their body to play this rhythm (i.e. stomp feet, snap fingers, click tongue, snort, etc.). These ways of playing rhythm and beat with our bodies are called BODY PERCUSSION.
9. Have each child write at the bottom of the page, their own group of notes that add up to 4 beats total.
10. Divide the class into groups of four students. Each person in the group gets to choose a body percussion/sound to use to bring sound to the rhythm of one line.
11. Model this for the class with 3, volunteer students and yourself. Perform the composition. This is called an ostinato.
12. Give students groups 10 minutes to pick one of their compositions to perform.
13. Invite each group forward to perform their composition.

# Original Orchestra Grade 3













Classroom Beginnings: The Science of Sound, Found Sounds, and Composition

Name \_\_\_\_\_

## Compose and Perform

Directions: Create your own rhythm with 4 beats. Write that rhythm in the boxes on the bottom row. In a small group of 4, have each person choose a different body percussion sound and rhythm line. Write each sound in the box underneath "Body Percussion." Practice performing your rhythms all together.

### Body Percussion

Original Orchestra Grade 2 | 6/10/2019

# Original Orchestra Grade 2

## Classroom Beginnings: The Science of Sound, Found Sounds, & Composition

### Lesson 5: Acoustic Ecology

#### Background

Acoustic Ecology is the study of sound in our environment and how it affects us. In this lesson students will have an opportunity to listen closely to environmental sounds. Students will apply their careful listening to critically evaluate which sounds are beneficial and which sounds cause hearing loss or emotional distress.

**Time:** 45 Minutes

#### Materials:

- Access to Youtube - <https://www.youtube.com/watch?v=li-oNQ2aTmc>
- Speakers

#### Procedure

1. Shut off the lights and invite students to close their eyes.
2. Ask students to sit quietly with their eyes closed listening for the sounds around them. Do this for about 1 minute.
3. Thereafter, ask students what distinct sounds they heard. Make a list.
4. Ask them how specific sounds made them feel.
5. Ask students if they remember what sound is. (Answer – Vibration).
6. If we were to draw a sound vibration it would look like an oscillating line. How then would we draw the difference between a loud and a soft sound? (Answer – The size of the waves in the line. Loud sounds are represented by bigger waves).
7. Using the diagram, ask students what sounds are too loud and what sounds are ok for us?
8. Using the following Youtube Clip, invite students to identify the sounds they hear and determine whether they represent sounds that are too loud or sounds that are ok and won't damage our hearing.  
<https://www.youtube.com/watch?v=li-oNQ2aTmc>

**Closing:** Invite children to draw an image of their ideal soundscape: one that makes them feel calm, happy, and healthy and one that does not damage their hearing. Drawings can be abstract or literal.

