Percussion Ensemble

Classroom Concert
Study Guide

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# Table of Contents

Academic Connections and Standards.................................................................3
Introduction to Percussion.....................................................................................4
Professional Percussionists...................................................................................5
Orchestral Percussion............................................................................................6
Percussion Ensembles Around the World.............................................................7
Lesson Plans...........................................................................................................8
   Percussion Ceremonies.....................................................................................8
   Instrument Classification..................................................................................9
Rare Wood Instruments.......................................................................................11
Academic Connections

This guide, when taught as a whole, aligns with the following Arizona State Standards:

Arizona State Music Standards
MU.K-2.ST1.C02.P01: Maintaining a steady beat with a partner or a group
MU.1.ST1.C02.P02: Play sounds that are loud/soft; fast/slow; high/low
MU.K-2.ST2.C01.P01: Use body movements to show variations in rhythm, pitch or tempo
MU.4-5.ST2.C02.P03: Identify and describe the origins and development of instruments.
MU.K-3.ST3.C01.P02: Name, identify, classify and categorize a variety of instruments.

Arizona State Social Studies Standards:
SS.K.ST4.CO4.P01: Discuss the food, clothing, housing, recreation, and celebrations practiced by cultural groups in the local community
SC.4.ST3.C01.P01: Describe how natural events and human activities have positive and negative impacts on environments
SC.5.ST5.C01.P03: Describe changes of matter: physical and chemical
SS.1-2.ST2.C04.P01: Discuss elements of culture of a community in areas studied

Arizona State Science Standards
SC.K-4.ST5.C01: Classify objects and materials by their observable properties.
Percussion

Everything but the

Percussion is the largest and most diverse instrument family. People typically define percussion as an instrument that can be struck, rubbed or shaken to create sound, but in reality, percussion players are expected to play many more instruments like sea shells, slide whistles and whips!

Next to the human voice, percussion instruments are widely believed to be the oldest musical instruments. Virtually every ancient civilization used percussion instruments in some way in their society. Percussion instruments are extremely varied in appearance and construction and can be used in a variety of ways. But before we study how they are used, it’s important to understand the science behind how these instruments create sound.

Percussion instruments are grouped into several categories based on how they vibrate. The three biggest categories are **idiophones**, **membranophones** and **chordophones**.

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All sound is made from vibration. Vibration is a quick, back-and-forth motion of an object. Think of a rubber band: when it is stretched tight and plucked, it moves back-and-forth rather quickly, and that is how it produces sound.

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**Percussion Instrument Categories**

**Idiophones** are instruments that vibrate themselves. If you have ever heard an electric razor or hair clipper buzz when it is turned on, then you've heard an idiophone. The back-and-forth vibration of the body of the instrument creates its sound. Idiophones include instruments like woodblocks, xylophones, tambourines, cymbals, chimes, and many more.

**Membranophones** are instruments that have a skin (also called a membrane) that vibrates to produce sound. This category includes most types of drums. When a drum is played, a percussionist hits the drum skin (or “drumhead”), which vibrates back-and-forth to produce a sound. Membranophones come in all shapes and sizes, but they all have a vibrating drumhead that creates sound when it vibrates back-and-forth.
**Chordophones** are instruments that create sound through the vibration of a *string*. And while the string family (violins, violas, cellos and basses) are obviously chordophones, there are a few members of the percussion family that qualify as well. Though they typically aren’t thought of as percussion instruments, pianos create their sound when a note on the keyboard activates a hammer which strikes strings inside the body of the instrument. Because the strings are *hit*, the piano is technically a percussion instrument. Other percussion chordophones include the hammered dulcimer, an instrument that takes several

**Percussion: Uses and History**

Percussion instruments have been used several different ways over the course of their history:

**Signaling:**
Drums and percussion are LOUD! Before the internet, television, phones, or newspapers, percussion instruments could send signals to people. They were loud enough to be heard throughout an entire village, which made them perfect for announcing things. In fact, they are so loud that many ancient and not-so-ancient civilizations used drums to signal on the battlefield. Using these instruments, drummers gave signals to their army, frightened the opposing forces, and even gave their own troops a boost in morale.

**Ceremonies:**
The repetitive rhythms found in some percussion music can have a hypnotizing effect that people have utilized in ceremonies, either religious or celebratory, for hundreds of years. Percussion music can be found at weddings in Java and at the meetings of tribal kings in West Africa. The Ashanti people use drums to cast out evil spirits, while ancient Jews used cymbals in their ceremonies.

**Entertainment:**
Percussion is as popular as ever. If you listen to music on the radio, then you’ve heard a drummer playing with a popular rock, pop or rap group. In particular, the drum set has provided the beat to the most popular dance music over the last century. Some talented percussionists have become so versatile and skilled that they make their living by playing percussion. The Phoenix Symphony has four professional percussionists. This means that their full-time job is to play percussion with the Symphony! Most professional percussionists begin playing percussion or another musical instrument at a very early age. Through years of personal practice and training, they are able to achieve a level of performance that allows them to play full-time.

**Dame Evelyn Glennie, DBE**
Evelyn Glennie was the first percussionist to make a living as a full-time solo percussionist. She is one of the world’s most accomplished musicians and one of the most famous percussionists. Evelyn began losing her hearing at the age of 8, and by the age of 12, she was considered “profoundly deaf.” Despite this, she graduated from the Royal College of Music at the age of 19, and went on to have an incredibly successful professional career.

Evelyn has performed as a soloist with every major orchestra in the world, and continues to compose music and release albums. She took a lead roll in the opening ceremonies for the London 2012 Summer Olympics, and has been named a Dame Commander of the Most Excellent Order of the British Empire, or DBE.
Orchestral Percussion

When you visit The Phoenix Symphony, chances are you’ll see these instruments on stage. Although percussion instruments are incredibly varied, many composers (or people who write music) use the following instruments very often when writing for percussion:

**Timpani:**
Timpani (also called “Kettledrums”) are membranophones. They are large copper bowls covered by a head. Orchestras typically assign one percussionist, called a “Timpanist,” to play timpani full-time in the orchestra. A timpanist can change the sound of the drums using foot pedals that tighten or loosen the drum heads.

**Snare Drum:**
The snare drum is a membranophone named for the wires (or “snares”) that are strung across the bottom head. These snares give the drum a distinctive, snappy sound that cuts well across the orchestra. These drums are also an important part of the drum set.

**Cymbals:**
Cymbals are some of the most ancient percussion instruments. These idiophones are crafted from a mixture of metals to achieve a particular sound. Some cymbals, which can be crashed together to give the music a big splash, are called “crash cymbals.” Other cymbals, which can be hit by a stick or a soft mallet, are called “suspended cymbals.”

**Xylophone:**
The xylophone is an idiophone made of wooden bars. In fact, “xylo-” means “wood” in Greek! Each bar is tuned to a particular note and has a corresponding resonator below it. These resonators make the sound louder and longer, so that it can be heard above the orchestra. Due to its unique, bony sound, the xylophone has been used by composers to remind their audiences of skeletons.

**Tambourine:**
The tambourine is an interesting instrument that is hard to classify. It could be called a membranophone, because it has a drumhead; or an idiophone, because of the jingles on the outside of the instrument. The tambourine has a very bright, metallic sound that can be mesmerizing in the hands of a skilled player.
Percussion Ensembles Around the World

Hearing percussion music played by a professional ensemble is a unique experience. Percussion ensembles come in many different varieties, and some of the most popular percussion styles are listed below:

**Bàtá:**
Bàtá drums originated in Nigeria where they were used by the Yoruba people for religious ceremonies. These drums, which come in several sizes ranging from the “baby drum” (kudi) to the “mother drum” (iya’lu), are played in a group of between 3 and 7 percussionists. Bàtá drumming was brought to Cuba during the African slave trade and has since become an important part of religious, musical and cultural life in Cuba while remaining central to Yoruba religious practice.

**Taiko:**
Taiko means “drum” in Japanese. These ensembles play simple but powerful drums in a very intense manner. The music they play is of folk or classical Japanese tradition. Some of these drums are very large; the biggest is called ō-daiko, which means “big fat drum.” It takes a tremendous amount of strength and endurance to play these drums, which can be as big as six feet in diameter!

**Gamelan:**
A gamelan is a traditional ensemble from Indonesia, which is an island nation in the South Pacific Ocean. These ensembles feature several different types of percussion instruments, especially metal bells and gongs, which are played sitting down. In addition to these percussion instruments, gamelan ensembles may incorporate bamboo flutes and singing as well. Gamelan groups accompany ceremonies or rituals (like weddings) and dancing, and they are popular on Indonesian radio.

**Marimba Bands:**
Marimbas are thought to have originated in Africa. Like many other percussion instruments, slaves brought marimbas to the Western Hemisphere by way of the slave trade. In Central America, marimbas (which are similar to a xylophone) were made out of rosewood, a very hard wood which was perfect for these instruments. In Guatemala in particular, groups of three or four musicians would all play on one marimba. As these groups became more popular in the early 1900s, they began touring the United States, and marimba became a very important instrument in the percussion family.
Lesson: Percussion Ceremonies
(Music/Social Studies)
Suggested Level: K-2

Time:
20 minutes—one full class period, depending on method

Standards:
Arizona State Music Standards
MUK-2.ST1.CO2.PO1: Maintaining a steady beat with a partner or a group
MUK-2.ST1.CO2.PO2: Play sounds that are loud/soft; fast/slow; high/low
MUK-2.ST2.CO1.PO1: Use body movements to show variations in rhythm, pitch or tempo

Arizona State Social Studies Standards
SSK.ST4.CO4.PO1: Discuss the food, clothing, housing, recreation, and celebrations practiced by cultural groups in the local community
SS1-2.ST2.CO4.PO1: Discuss elements of culture of a community in areas studied

Objectives:
TSW gain understanding of Native American musical and ceremonial practices.
TSW create and perform percussion music reflecting the moods or feelings of particular ceremonies.
TSW respond to peer-created music through varied movements.

Materials Required:
Various percussion instruments—drums, rattle, etc.; authentic Native American instruments are preferable

Note to the teacher:
This lesson is intended as part of a unit on the study of Native American cultures, especially as an introduction to the ceremonial and ritualistic aspects of those cultures. If possible, choose ceremonies actually practiced by a regional tribe (see below).

Prerequisites:
Students could have some knowledge concerning tempo (how fast or slow a piece of music is) and dynamics (how loud or soft music is), but the lesson would also work very well as an introduction to these musical concepts.

Practice:
Native American cultures use music, which often includes singing and percussion, to accompany specific ceremonies. Depending on the tribe, music might be used in purification ceremonies, war dances, festivals celebrating food harvest, to tell a story, for religious ceremonies, or in a host of other situations. The students will be creating their own music to accompany ceremonies that are assigned by the teacher.

Students should divide into groups of four or five (or, with younger students, work as a class). Assign each group a “ceremony” that they will be creating music for (preferably something secular). With the help of the teacher, students should decide whether their ceremony might require a fast tempo or a slow tempo. For example, a funeral might necessitate a slow tempo, while a war preparation ceremony might require a fast tempo. Once this is decided, students should pick a dynamic, or volume, for their ceremony. For example, music that tells the story of a hunt might be loud, while music that accompanies ancestral remembrance might be soft.

Once these musical parameters have been decided, each group will use percussion instruments to play a steady beat using their chosen tempo and dynamic level. The rest of the class, which should encircle the instruments, should move in a circle and in the manner of the music. For instance, students might move slowly and with quiet steps for a funeral ceremony/beat, or stomp quickly for a war ceremony/beat.

As a class, discuss if the music from each group was appropriate for the ceremony. Did the dynamics match the situation? What about the tempo?
Lesson: Instrument Classification
(Music/Science)
Suggested Level: K-2

Time:
30 minutes

Standards:
Arizona State Music Standards
Strand 3, Concept 1 (K-3): Name, identify, classify and categorize a variety of instruments.

Arizona State Science Standards
Strand 1, Concept 1 (K-3): Observe, ask questions and make predictions.
Strand 5, Concept 1 (K-4): Classify objects and materials by their observable properties.

Objectives:
TSW grasp the scientific process of classification through percussion instrument categories.

Materials:
At least one idiophone (triangle, tambourine, woodblock, shaker, etc.), membranophone (a drum of some sort), and chordophone (preferably a piano).

Introduction:
Scientists classify objects and organisms using certain parameters, including physical traits and behavior. For example: an ant is considered an insect because it has six legs, a segmented body, and lays eggs, among other reasons. Percussion instruments can be similarly categorized according to their traits and behavior. These categories include idiophones, membranophones and chordophones. While organisms are categorized by their traits and behavior, percussion instruments are categorized by how they make sound. These three groups are defined as follows:

- **Idiophones**—instruments that vibrate themselves when struck. A triangle is an idiophone because, when it is hit, it rings to create sound. Other idiophones include cymbals and xylophones.

- **Membranophones**—instruments that have a drumhead that vibrates. These include most of what we typically call “drums.”

- **Chordophones**—instruments with strings that vibrate when struck. Even though it isn’t commonly labeled as such, the piano is actually a percussion instrument because its strings are struck by hammers.

Procedure:
Begin by reviewing classification as a process and idea. Students should have a clear understanding of how to observe objects or organisms using their five senses and apply their observations of an organism’s behavior and physical traits toward classification.

Just as organisms can be separated into categories based on behavior and physical traits, musical instrument are most commonly categorized by how they make sound, which is similar to an organism’s behavior. Introduce the categories listed above (idiophones, etc.) and the criteria a percussion instrument must meet to be included in the category.

Students should then observe an example of a percussion instrument from each of the aforementioned categories without being told beforehand which category they belong to. Using their five senses, students should make observations in the same way they would for organisms or other classification exercises. Students should take down notes about each instrument they observe, including physical characteristics, but paying particular attention to how they think the instrument creates sound; they should also predict which instrument category the percussion instruments belong to.

Practice:
As a class, discuss why each instrument belongs in its respective group and ask students if they predicted correctly or incorrectly. Then, provide students with online resources to explore other percussion instruments from the list on the next page:
http://www.dsokids.com/listen/instrumentlist.aspx
http://www.nyphilkids.org/lockerroom/main.phtml?

If possible, students can divide into groups and find their own percussion instruments that belong to each category. List the three categories on the board. As a class, fill in each list, giving the groups or individuals an opportunity to talk about the traits and musical behavior of the instruments they studied.
Percussion Instrument Categories & Examples

**Idiophones**—"Idiophones produce sounds through the vibration of their entire body."
- Cowbell
- Castanets
- Xylophone
- Marimba
- Glockenspiel
- Chimes
- Cymbals
- Wood block
- Steel drum
- Crotales
- Claves
- Cajón
- Triangle

**Membranophones**—"Membranophones produce sound when the membrane or head is struck."
- Bass drum
- Snare drum
- Bongo
- Conga
- Timpani
- Tom-tom
- Djembe
- Tabla

**Chordophones**—“Percussive chordophones are string instruments that are struck by a hammer or mallet.”
- Hammered dulcimer
- Piano
- Cimbalom
- Yangqin
Lesson: Rare Wood Instruments
(Music/Science)
Suggested Level: 4-5

Time:
40 minutes—one full class period

Standards:
Arizona State Music Standards
MU405.ST2.CO2.PO3: Identify and describe the origins and development of instruments.

Arizona State Social Studies Standards
SC4.ST3.CO1.PO1: Describe how natural events and human activities have positive and negative impacts on environments
SC5.ST5.CO1.PO3: Describe changes of matter: physical and chemical

Objectives:
TSW relate reversible and irreversible change in matter to sustainable or unsustainable resource harvesting.
TSW question the use of rare natural materials in making musical instruments.

Materials Required:
Online access to the following websites (or other videos featuring the xylophone or marimba):
http://www.youtube.com/watch?v=egwXKQDYcvc
http://www.youtube.com/watch?v=b8uyEe3nKfo

Prerequisites & Background Information:
Students could have some knowledge concerning reversible and irreversible change (e.g., burning paper is irreversible, while freezing water is reversible). Some background knowledge on the xylophone and marimba is also necessary:

The xylophone and marimba have beautiful, resonant sounds. Professional xylophones and marimbas are made from a specific type of wood called Honduran rosewood. This wood, which is only found in a small part of Central America, is used in a variety of ways, including furniture building and instrument making. Instrument makers go through tons of rosewood to find the pieces that work well for these instruments, and much of this discarded wood is wasted.

Rosewood harvesting is quickly depleting the supply of rosewood to the point that, if current methods of harvesting are maintained, the remaining rosewood will not be suitable for xylophone or marimba making. To combat this, musical instrument companies have created synthetic bars for these instruments that resemble, but do not replicate, the sound of rosewood. Other woods, like cocobolo and padauk, have been substituted, but these woods offer a less-than-ideal sound. Often, these cheaper rosewood alternatives are used by schools and students, while professional performers and colleges purchase rosewood instruments.

Practice:
Relate reversible/irreversible change to the wood harvested to create the xylophone and marimba: is cutting wood a reversible or irreversible change? Is cutting a tree down reversible or irreversible? Some points to consider:

- Scientifically, wood cutting is irreversible, because the wood cannot be bonded back together in its original form.
- Scientifically, cutting down a tree is irreversible, because the tree dies and will not re-grow.
- New trees can be planted to replace those harvested for wood, but this takes time.

Define sustainable to the students: of, relating to, or being a method of harvesting or using a resource so that the resource is not depleted or permanently damaged. Draw the students’ attention to the similarities and differences between reversible/irreversible change and sustainability. When scientists talk about reversible/irreversible change, they are typically talking about a specific item or object being changed, while sustainability deals with large-scale resources, a supply or material that people benefit from. If a method of harvest is sustainable, it tries to maintain the resource for generations to come. An unsustainable harvest method does not consider the future and often completely destroys the resource.

Facilitate a discussion based on the background information provided: is the use of rosewood to create high-quality musical instruments justifiable? Why or why not? Create a t-chart on the board and have students add their arguments to either side.