

Tool Kit II

Organology – The Study of Musical Instruments

Objective

Explore the classification of musical instruments, also known as the science of organology, and refine the understanding of how musical instruments produce sounds.

Materials

- MIM organology flash cards
- Post-it notes or similar

Arizona Science Standards Addressed

Strand 2: History of Science as a Human Endeavor

Concept 1: History of Science as a Human Endeavor

Concept 2: Nature of Scientific Knowledge

Strand 3: Science in Personal and Social Perspectives

Concept 2: Science and Technology in Society

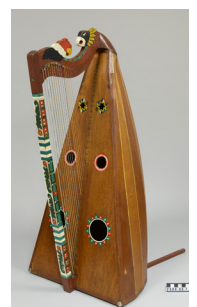
Strand 5: Physical Science

Concept 1: Properties of Objects and Materials

Idiophone “Ideo” means personal. Idiophones produce their sound by setting up vibrations in the body of the instrument itself. Examples at MIM include instruments such as steel pans, handbells, and thumb pianos.



Chordophone “Chordo” means rope or string. Chordophones produce sound by setting up vibrations on a stretched string. Examples at MIM include instruments such as the violin, guitar, harp, and piano.



Background Information for Educators

Musical instruments can be classified in many ways. Some instruments make loud sounds, others soft sounds. Some instruments are made of wood, others of metal. Some instruments play very high notes, others very low notes. Some instruments are played in specific ensembles or used to create specific genres of music, others are used universally, across genres and cultures. The science of organology classifies musical instruments by identifying what generates the vibrations that create the sound. Known as the Hornbostel-Sachs system, the six organological families of instruments are:

Membranophone “Membrano” means skin.

Membranophones produce their sound by setting up vibrations in a stretched membrane. Examples at MIM include drums from all over the world.



Aerophone “Aero” means air. Aerophones produce their sound by setting up vibrations in a body of air; they can also be thought of as vibrating columns of air. Examples at MIM include many flutes and the pipe organ.



Electrophone “Electro” means electric. Electrophones produce sound primarily from electricity. As a result, they often require an amplifier and speaker to be heard. Some electrophones, such as the electric guitar, could fit in two categories (chordophone and electrophone). Examples of electrophones at MIM include the turntable, theremin, and Hammond organ.



Corpophone “Corpo” means body. Corpophones are “body sounders,” in which a vibration or action is produced by a body part (or parts). Examples include handclaps, slaps on the body, snaps of the fingers, and so forth, but do not include vocalizations. Examples of corpophones at MIM include the rhythmic hand clapping, called *palmas*, in flamenco music (Spain) and the body percussion and chest-slapping in the Maori haka of New Zealand.



**Instrument photos can be printed or turned into flash cards ahead of time. Students can also work with various small musical instruments, if available.*

Divide students into small groups and invite them to list as many different musical instruments as they can on individual Post-it notes. If they don't know the name of an instrument, invite them to briefly describe the instrument instead (e.g., "that brass instrument with the slide that moves in and out"). Invite students to quickly brainstorm as many different ways of grouping, classifying, or organizing these musical instruments as they can, grouping and regrouping the Post-it notes with each new method of organizing musical instruments. Invite one student to record the group's answers to the following questions:

How many different musical instruments can we name (or describe)?

How many ways of classifying or grouping these musical instruments can we come up with?

Examples: according to materials used to make them [the way it was done in ancient China], according to which section of the orchestra they belong, etc.

Are any instruments, cultures, or genres of music not represented in our classification system?

Introduce the term "**organology**" and present the students with the MIM organology flash cards. Encourage students to work together to categorize each of the instruments on the cards. Give them several minutes to work through all the photos. Encourage them to create a list or graph representing the different categories, assigning one person as the recorder.

Why should we classify musical instruments?

Like classifications of animals or anything else, it helps us organize instruments across cultures or geographic locations in a logical way.

What does a universal classification system—such as the one based on how instruments create vibrations—mean for those who study musical instruments and cultures? Why is it helpful?

Universal classification enables us to observe similarities and differences in musical instruments across cultures. For example, one culture's design

and use of an aerophone or membranophone may differ from another culture's use of an aerophone or membranophone.

Can a system ever be perfect? Can every instrument be categorized neatly or into one clear category? Why or why not?

Some musical instruments represent a combination of one or more types of instruments. For example, the sound of a chordophone such as the guitar depends heavily on the shape and design of its body, making it similar to an idiophone. Other chordophones combine elements of a membranophone (such as the banjo) in how they produce sound. Generally speaking, Hornbostel-Sachs looks at what originates the sound wave energy but there are always exceptions. Brass instruments, a type of aerophone, initiate their sound with vibration of the human lips, making them similar to a corpophone.

Use the video clips on [MIM's YouTube channel](#) (especially the "See It Played" and "From the Collection" playlists) to increase student understanding of different musical instruments.

Extensions

Did anyone come to a different conclusion? Does anyone want to clarify, verify, or challenge that idea? Do you agree or disagree?

What is the history of the Hornbostel-Sachs musical instrument classification system? Has it been altered since it was first developed?

A persuasive writing or research report exercise can be appended here as applicable.

Assessment

Formative

Students will demonstrate their understanding of organology, as well as their understanding of the properties and materials of musical instrument construction through their interaction with their peers.

Summative

Students can explain the history of the Hornbostel-Sachs system of organological classification, the purpose of its development, and the technological innovations that required its alteration.