CREATE A GLOBAL CLASSROOM

MIM

BEST FOR GRADES 3-12

MUSICAL INSTRUMENT MUSEUM

Overview

Tool Kits I–III are designed to prepare students in grades 3–12 for a field trip to MIM. Follow a strand (elementary, middle school, or high school) through each of the tool kits and find suggested discussion questions, domain-specific vocabulary, and writing prompts.

Each set of resources focuses on a geographical area, ancient culture, or instrument type that exemplifies the concepts of cultural diffusion and music archaeology. By honing their research skills, using primary source readings, looking at photographs, and learning about objects in MIM's collections, students will begin to understand how musical instruments and musical ideas are shared, traded, and built upon as people around the world encounter each other.

The following lessons address Arizona 3rd—12th grade standards in these areas:

ARIZONA SOCIAL STUDIES STANDARDS

Geography World History Human Systems Economics

ARIZONA STATE STANDARDS IN SCIENCE

Inquiry Process
Physical Sciences

ARIZONA'S COLLEGE AND CAREER READY STANDARDS (AZCCRS)

English Language Arts | Reading Standards for Informational Text, Writing Standards, Reading Standards for Literacy in Science and Technical Subjects Mathematics | Measurement and Data, Operations and Algebraic Thinking

ARIZONA ARTS STANDARDS

Music Visual Arts



A student watches video clips at MIM's Boat Lutes display.



High school students visit the Democratic Republic of the Congo in MIM's Africa Gallery.



Students on a Discovery field trip to MIM.

CULTURAL DIFFUSION AND TRADE ROUTES

Tool Kit I



MIM's Silk Road display

Objective

Students are introduced to the concept of **cultural diffusion** through objects from MIM's collection (two spike lutes), which represent the transmission of musical ideas along the Silk Road during the first millennium CE (1,000–2,000 years ago).

Background Information for Educators

Some instruments are created in one place but move around the world and change over time, as people encounter each other and trade ideas and cultural influences. This is known as **cultural diffusion**. For example, merchants and travelers carried goods, music, musical instruments, culture, technology, and news along the trade routes known as the **Silk Road**. Trade routes like these play an important role in cultural diffusion.

What is collectively called the "Silk Road" was a set of caravan trade routes that stretched about seven thousand miles from eastern China through Central Asia to as far west as Turkey, and northeast to as far as Japan. The

golden age of trade along these routes was during the first millennium CE (1,000–2,000 years ago). The starting point was in the Chinese city of Xi'an (SHEE-yan), which was a center for silk production. From there, routes splayed out heading to the Mediterranean and as far south as India. Along with the caravans carrying silk, spices, and other goods, many traders, pilgrims, and merchants carried their traditions, philosophies, and musical instruments with them

The *kamancha* (kah-MAHN-chah), for example, traveled from Iran to China and influenced the creation of the *erhu* (AR-hoo), which today is played in Chinese musical traditions such as the *sizhu* ("silk and bamboo" music) ensemble and the Beijing Opera pit orchestra. The name *erhu* actually gives a clue about its origin: *er* means two (as in two strings) and *hu* refers to some ancient people from Central Asia who used to invade China from the west. Both the *kamancha* and *erhu* are **spike lutes**, which means the neck is a rod that runs straight through the resonator. Today, spike lutes are played throughout the Middle East, Africa, and Asia.

SILK ROAD

CULTURAL DIFFUSION AND TRADE ROUTES

Tool Kit I

Images, Videos (Click here for all images and videos)



Erhu (spike lute) from China in MIM's Silk Road display



Kamancha (spike lute) from Azerbaijan in MIM's Silk Road display



Kamāncheh (spike lute) from Iran in MIM's Iran display



<u>Video of an erhu being</u> played



Map of the Silk Road



<u>Video of a kamāncheh</u> <u>being played</u>

Discussion Questions, Writing Prompts

Standards Addressed	Prompt
Social Studies, 3 rd –6 th Grade Strand 4: Geography Concept 1: The World in Spatial Terms	
Social Studies, 5 th –6 th Grade Strand 2: World History Concept 3: World in Transition Concept 5: Encounters and Exchange	Trace the "route" that the <i>kamancha</i> traveled from Iran to China, where it influenced the creation of the <i>erhu</i> , using the map of the Silk Road .
Social Studies, High School Strand 4: Geography Concept 4: Human Systems	
Social Studies, 6 th –7 th Grade, High School Strand 4: Geography Concept 3: Physical Systems Concept 4: Human Systems Concept 6: Geographic Applications	Can you think of more reasons that people might travel or move from one place to another? <i>Trade, tourism, forced migration, war, etc.</i>
Social Studies, 6 th Grade Strand 4: Geography Concept 6: Geographic Applications Social Studies, 7 th Grade Strand 4: Economics Concept 1: Foundations of Economics	What do you think it was like to travel along the Silk Road? What sights might you see? What things or people might you encounter? Use the Additional Resources about the Silk Road to learn more about life along these trade routes.

CULTURAL DIFFUSION AND TRADE ROUTES

Tool Kit I

Standards Addressed	Prompt
Social Studies, 6 th Grade Strand 4: Geography Concept 2: Places and Regions	
Music, 3 rd -8 th Grade Responding Apply teacher-provided criteria to evaluate music Connecting Relationships between musics and other content areas Context for performances Music, High School Connect – Reflect on Understanding Connections between music and other content areas Personal reactions to musical experiences	Using the photo of the <i>kamancha</i> from Azerbaijan, the photo and video of the <i>kamāncheh</i> from Iran, and the photo and video of the <i>erhu</i> , answer the following questions: 1. How are the <i>erhu</i> and <i>kamancha/kamāncheh</i> similar? 2. How are they different?

Additional Resources

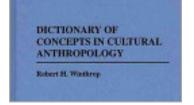
Click on the thumbnail to see each resource

ory / Social Studies / Science

"BEAUTIFUL ART" — CULTURAL D Designed by Ramón Esquivel (2006

RODUCTION: This lesson is designed to give students a con ural diffusion and the notion that ideas change people and peolives a teacher demonstration, student role-play, and an activit ents in the class. This lesson integrates history, social studies utilizes process drama techniques.

Cultural Diffusion | Lesson plan by Esquivel, Ramón. "Beautiful Art: Cultural Diffusion."



Cultural Diffusion | Dictionary of Concepts in Cultural Anthropology. "Theories in Diffusion."



Silk Road | American Museum of Natural History. "Traveling the Silk Road."



Silk Road | China Institute. "From Silk to Oil: Cross-Cultural Connections Along the Silk Roads."

MUSICAL ARCHAEOLOGY

Tool Kit II



MIM's Egypt display

Objective

Students are introduced to research methodology related to **musical archaeology**. Students will analyze informational text, such as photos, videos, and published studies, related to ancient Egyptian and ancient Andean civilizations and gain an appreciation for the musical legacies they left behind.

Background Information for Educators

We know from archaeological evidence that music has always been an important component of human life, from ancient civilizations until today. Archaeologists unearth evidence from tombs, temples, and other sites that give us clues about the daily lives, technology, and values held by ancient peoples. These artifacts often include depictions of musical instruments, references to music in ancient texts, and sometimes actual musical instruments. Sometimes, these instruments are even playable. When they are not playable or when they are too fragile to play, ethnomusicologists can also use the science of acoustics to predict the sounds these ancient instruments made. Combining what they learn from the ancient instruments with modern music from the same area or culture group (such as musical aesthetics, instrument construction, and playing techniques), ethnomusicologists can make educated guesses about music in ancient cultures. This type of research is called musical archaeology.



Kawala in MIM's Egypt display

Ancient Egypt

Based on evidence from Egyptian archaeological sites, there is no doubt that ancient traditions have influenced modern practices. Ancient murals and carvings on the walls of tombs and temples show us that music was integral to people's daily lives during Egypt's pharaonic period. Included in these murals are familiar instruments such as harps, lyres, reed pipes, and plucked lutes. Musicians are shown performing during rituals, weddings, and other celebrations, and even while working—a clear indication that music was part of all aspects of Egyptian life.

MUSICAL ARCHAEOLOGY

Tool Kit II

MIM's exhibit highlights two important periods and their lasting legacies: the pharaonic period (3200–332 BCE) some five thousand years ago and the era of folk music that is still played today. Many of the modern instruments played by folk musicians in Egypt (and throughout the Middle East and Africa) have changed very little in the last four millennia! For example, we know that **flutes** were in use during the pharaonic period, thanks to evidence from murals and other surviving records. A contemporary example of these flutes on display at MIM is the *kawala* (kah-VAHL-ah). The *kawala*'s construction and playing position are almost identical to what is depicted in the murals.

But, archaeologists have also uncovered ancient examples of these flutes, which are now kept in museums or private collections. Ethnomusicologists can study and learn from these examples because they can still be played and make sound. Using recording technology and the **science of acoustics**, researchers can recreate the notes these flutes once made, which provides clues about how the music might have sounded.



Sikus (panpipes) in MIM's Peru display

Ancient Andes

Panpipes, called *sikus* in Peru, have been played in the South American Andean region for a long time. The panpipe is an example of an instrument type that has endured the test of time, the rise and fall of different cultures in the Andean region, Spanish colonization, and modernization. It is still a cherished instrument performed today in Peru and throughout the South American Andes. Today, *sikus* are made of cane or bamboo and are played in pairs. Sometimes two rows of panpipes are tied together and sometimes they are separated and played individually.



MIM's Ancient Andes display

In MIM's Ancient Andes display, there are examples of panpipes made of bone, ceramic, and reed identified with the ancient culture of the Nazca people. The panpipes made of bone and ceramic are between 1,400 and 2,100 years old! Because materials such as bone and ceramic last a long time without deteriorating (unlike bamboo or other woods), those are the most common examples available for today's musical archaeologists to study. One of the instruments on display, panpipes called antara, is still playable and its pitches were studied by one of MIM's curators. Ancient instrument examples like these are playable, with each pipe producing the same pitch and roughly the quality of sound the Nazca people intended when they made them nearly two thousand years ago. In the case of panpipes, each pipe plays one note. The science of acoustics dictates that the longer the tube, the lower the note. Conversely, the shorter the tube, the higher the note. What we can never know, however, is how panpipe players in the ancient Andes put these pitches together into the melodies, rhythms, and forms of their music.

MUSICAL ARCHAEOLOGY

Tool Kit II

Images, Videos (Click here for all images and videos)



Antara (panpipes)
attributed to the Nazca
people in MIM's Ancient
Andes display



Video of a kawala being played



Kawala in MIM's Egypt display



Video of an antara being played



Sikus (panpipes) in MIM's Peru display



Video of sikus being played



Tone generator

Ancient Egyptian Musical Scale by

Mahmoud Effat Prof. Fathi Salch titute of Arabic Music Faculty of Engine temp of Arts - Cairo Cairo University

Pathi Saleh Prof. Robert Gribbs y of Engineering California State

Introduction

There is a lost link between the ancient experime must can the main of other cultitations. This is due to the first thefree was no attempt play the ameterst experiment and try to discover their features are are of two extigators in the strength of the control o

In order to carry this project a team was formed from specialists o oriental music, history of music, computer systems specialists and music scientists under the supervision of the staff of the Egyptian Antiquities organization of (EAO). The team had the following objectives:

1- Carrying precise measurement of all the wind instruments in the Egyptian Museum with two purposes.
a Checking the old measurements carried by Dr. Hans Hickmann

"On the Discovery of the Ancient Egyptian Musical Scale" by Mahmoud Effat, et al.

ROBERT STEVENSON

Ancient Peruvian Instruments

I

Is variety of instrumental types and shiftid fishciation sufficiently indirect their mission claute, them she of the Previous peoples as the Natos, Mochies, and Clauti ommitteped any of the shorigand groups in Mexico or Control America. The Attract Association of the Control of the Nation of Control of America The Attract Association of Control of Co

When the hole of a bone flute has been corrected by being partly refilled, or filled and another drilled in its place,* as in specimens both at the National Museum and in the private collection of Arture Jiménez Boqia at Lima, the maker obviously sought a predetermined sound. But far more decivies in proving pitch intension are the numerous syrinxes which survive from the Peruvian archaeological past. Today in

"Ancient Peruvian Instruments" by Robert Stevenson

			Notes from MIM Cura
Ansara Pipe #	Note frequency (Hz)	Approximase Pisch	resus from MIM Can
1	342	н	
2	418.3	Ab4	
3	522	cs	
4	680	risis	Quarter tone between E
5	700.5	FS	
6	884	A5	
7	980.5	85	
8	1038	C6	
9	1304	66	
10	13/3	16	
n	1524	Cb6	
12	1661	Alai	

Frequency Tables

Image in MIM's Egypt display showing part of a mural from a tomb in Thebes

MUSICAL ARCHAEOLOGY

Tool Kit II

Discussion Questions, Writing Prompts

Standards Addressed	Prompt
English Language Arts, Middle School Reading Standards for Informational Text Integration of Knowledge and Ideas	
Visual Arts, K–High School Creating Generate and conceptualize artistic ideas and work	The image in MIM's Egypt display shows part of a mural inside a tomb in Thebes. What instruments do you see? (Harp, plucked lute, double single-reed pipes)
Visual Arts, Middle School Responding Cultural associations suggested by visual imagery	
English Language Arts, 3 rd –5 th Grade Writing Standards Text Types and Purposes	Use either of the Egyptian murals (<i>Tomb of Niankhknum</i> , <i>Theban Tomb no.38</i>) included in the <i>Additional Resources</i> section and create a short story. If the mural were a "freeze frame" of a moment in time, what do you think happened right before it was "frozen"? Who are each of the characters represented in the mural? What are they thinking and doing?
English Language Arts, Middle School Reading Standards for Informational Text Key Ideas and Details Integration of Knowledge and Ideas	
Music, 3 rd -8 th Grade Responding Apply teacher-provided criteria to evaluate music Connecting Relationships between musics and other content areas Context for performances	Using the photo and video of the <i>antara</i> and the photo and video of the <i>sikus</i> , answer the following questions: 1. How are the <i>antaras</i> and <i>sikus</i> similar? 2. How are they different?
Music, High School Connect – Reflect on Understanding Connections between music and other content areas Personal reactions to musical experiences	

MUSICAL ARCHAEOLOGY

Tool Kit II

Standards Addressed	Prompt
Social Studies, 3 rd -6 th Grade, Middle School, High School Strand 2: World History Concept 1: Research Skills for History English Language Arts, Middle School, High School Reading Standards for Literacy in Science and Technical Subjects Key Ideas and Details Craft and Structure Integration of Knowledge and Ideas	Answer the following comprehension questions: "On the Discovery of the Ancient Egyptian Musical Scale" 1. Why is it difficult to rediscover stringed instruments' original tuning? 2. In contrast, what is it about wind instruments that allow researchers to rediscover their original tuning? 3. Why did the researchers choose to compare the ancient Egyptians' music to the diatonic (aka Western) scale? "Ancient Peruvian Instruments" 1. Why do you think antaras (panpipes) and flutes made of stone and bone are studied most often? 2. What materials are contemporary panpipes made out of? 3. What are some examples of the provenance, or original place, in which antaras and bone flutes have been found?
English Language Arts, Middle School Reading Standards for Informational Text Integration of Knowledge and Ideas Mathematics, 4 th –5 th Grade Measurement and Data Operations and Algebraic Thinking Science, 4 th –6 th Grade Strand 1: Inquiry Process Strand 5: Physical Science	Use the table of frequencies created from "On the Discovery of the Ancient Egyptian Musical Scale" to answer the following questions: 1. Which flute plays the lowest pitch? Which flute plays the highest pitch? 2. Determine what note each frequency refers to. Use the tone generator. Why do you think there isn't always a perfect match between the frequency and a note?
English Language Arts, Middle School Reading Standards for Informational Text Integration of Knowledge and Ideas Mathematics, 4 th -5 th Grade Measurement and Data Operations and Algebraic Thinking Science, 4 th -6 th Grade Strand 1: Inquiry Process Strand 5: Physical Science	Use the table of frequencies created by one of MIM's curators for the ceramic antara in MIM's Ancient Andes display and the photo of the antara to answer the following questions: 1. Determine how many tubes the antara has and check your answer by examining the photo 2. Using the tone generator, determine what note each frequency refers to. Why do you think there isn't always a perfect match between the frequency and a note? Use the Additional Resources about Flute

Acoustics to learn more about how playing techniques

can affect sound and pitch

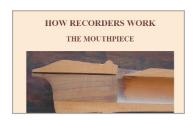
MUSICAL ARCHAEOLOGY

Tool Kit II

Standards Addressed **Prompt** Create mathematical phrases that represent the following statements: 1. If two notes have an interval of one octave between them, then the frequency of the higher pitch is twice that of the lower pitch. 2. The frequency at which a medium (such as a Mathematics, 4th Grade wooden flute, or a ceramic panpipe) vibrates is the Operations and Algebraic Thinking same as the frequency of the sound (i.e., the source of the vibration). Science, 4th-6th Grade 3. The frequency of a low-sounding note is less than Strand 1: Inquiry Process the frequency of a high-sounding note. 4. The **theory of resonance** states that given a tube open from both sides, it will resonate at a frequency corresponding to a wavelength that is equal to twice the length of the tube. (summarized from "On the Discovery of the Ancient Egyptian Musical Scale"). Use the Additional Resources about Flute Acoustics to learn more.

Additional Resources

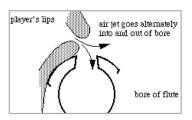
click on the thumbnail to see each resource



Flute Acoustics | "How Recorders Work."



Egyptian Mural | Theban Tomb no.38 of Zeserkaresonb



Flute Acoustics | University of New South Wales. "Flute Acoustics: An Introduction."



Egyptian Mural | Theban Tomb no.38 of Zeserkaresonb



Egyptian Mural | Tomb of Niankhkhnum and Khnumhotep at Saqqara in the Fifth Dynasty

MUSICAL ARCHAEOLOGY

Tool Kit II

Table of Frequencies

Generated by one of MIM's Curators for the Ceramic Antaras in MIM's Ancient Andes Display (Accession # 2012.188.8)

Antara Pipe #	Note Frequency (Hz)	Approximate Pitch	Notes from MIM Curator
1	342	F4	
2	418.5	A4	
3	522	C5	
4	680	Fbb 5	Quarter tone between E5 & F5
5	700.5	F5	
6	884	A5	
7	980.5	B5	
8	1038	C6	
9	1304	E6	
10	1373	F6	
11	1524	Gb6	
12	1661	A ♭6	
13	1812.5	Выб	Quarter tone between A6 & Bb6

Table of Frequencies

Generated from a Bamboo Egyptian Flute from the Cairo Museum ("Flute #4," also denoted as "69817")

On the Discovery of the Ancient Egyptian Musical Scale (Effat, Mahmoud)

Flute Note #	Note Frequency (Hz)	Approximate Pitch	Notes from Authors
1	419.9	A4	
2	168.4	B4	
3	198	C5	
4	540.5	D5	
5	625.2	E5	
6	687.3	F#5	
7	732.2	G5	
8	839.5	A5	

MYSTERIOUS SYMBOLS CAST IN ANCIENT BRONZE

Tool Kit III



MIM's Ancient Vietnam display

Objective

For researchers, artifacts from ancient cultures often generate just as many questions as they do answers. By examining the **symbols** on bronze drums from Ancient Vietnam, students will begin to think like archaeologists: Why were these symbols put on musical instruments? What can we learn about the Dong Son culture from these musical instruments? What questions remain?

Background Information for Educators

MIM's Ancient Vietnam display features ancient bronze instruments from prehistoric civilizations of Vietnam. The Dong Son culture (1000 BCE-300 CE) some 1,700 to 3,000 years ago was centered on the Red River Delta of northern Vietnam, not far from the modern capital, Hanoi. Although this ancient culture completely disappeared, artifacts were left behind from which researchers can learn. Archaeological excavations of Dong Son sites suggest that it was a warlike culture and that its people developed complex agricultural methods and were highly skilled in ceramics and bronze-casting. Dong Son people were spread out across the region in a network of "chiefdoms" connected by rivers and canals. When the Han Chinese colonized the region in the early first millennium, they counted approximately one million members of this culture! The most important and distinctive artifacts of the Dong Son are the drums that they cast from bronze, called bronze drums. We know that the Dong Son people highly valued these drums and that they played them during important rituals and ceremonies.

All of the examples on display at MIM are on loan from Chan and Quynh Kieu, who possess the largest private collection of Dong Son artifacts. The surfaces of the drums are elaborately ornamented with repeating **symbols** that give us tantalizing clues about the culture. In order to examine the symbols more easily, one of MIM's curators and MIM's exhibit designer made graphic renderings of certain sections of the drums. These **line drawings** made it easier to see shapes and distinguish decorations, since the drums' surfaces are heavily corroded from having been buried for almost two thousand years.

We can only make educated guesses at the meaning of the symbols. The "sun" or "star" pattern at the center of the tympanum (top) is probably only negative space, between "seed" icons. Birds (possibly cranes) are also visible. There is imagery depicting a ritual procession. It includes crested warriors and a house or religious structure. The figure that looks like it is being pulled behind the warriors may represent a prisoner.



Closer view of tympanum (top) on bronze drum in MIM's Ancient Vietnam display

That same bronze drum features what appear to be three individuals (possibly ritual leaders) on a boat with a water buffalo. We believe that the buffalo was meant for a sacrifice, similar to ritual offerings still performed by tribal groups in Southeast Asia and southern China today.

Bronze drums may include lots of ancient symbols, but the drums themselves have become symbols, too; they've become symbols of Vietnamese culture! In fact, a **postage stamp** was released that pictured the drums. The Vietnamese are very proud of the Dong Son culture, and the drums and other artifacts they made, because these represent a highly sophisticated civilization that existed in Vietnam a very long time ago, before the advent and influence of outside cultures.

MYSTERIOUS SYMBOLS CAST IN ANCIENT BRONZE

Tool Kit III

Images, Videos (Click here for all images and videos)



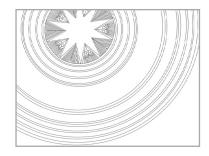
Line drawing of boat scene on bronze drum in MIM's Ancient Vietnam display



Line drawing of tympanum (top) on bronze drum in MIM's Ancient Vietnam display



Line drawing from a bronze drum tympanum (top) in the National Museum in Hanoi



Blank line drawing of tympanum of a bronze drum



Closer view of tympanum (top) on bronze drum in MIM's Ancient Vietnam display



Closer view of boat scene on bronze drum in MIM's Ancient Vietnam display



Vietnamese postal stamp depicting a bronze drum



Bronze drum from MIM's Ancient Vietnam display

MYSTERIOUS SYMBOLS CAST IN ANCIENT BRONZE

Tool Kit III

Discussion Questions, Writing Prompts

Standards Addressed	Prompt
English Language Arts, 3 rd –5 th Grade Writing Standards Text Types and Purposes	Use the line drawing of the boat scene and create a short story. If the scene were a "freeze frame" of a moment in time, what do you think happened right before it was "frozen"? Who are each of the characters? What are they thinking and doing?
English Language Arts, Middle School Reading Standards for Informational Text Integration of Knowledge and Ideas Visual Arts, K-High School Creating Generate and conceptualize artistic ideas and work Visual Arts, Middle School Responding Cultural associations suggested by visual imagery	 Make a list of the symbols you can see on MIM's bronze drum. There are symbols on the tympanum (top) and symbols on the side—a boat scene. What categories can those symbols be separated into? (Animals, man-made, alive, nonliving, etc.) Make a similar list for the line drawing from a bronze drum tympanum (top) in the National Museum in Hanoi that shows people playing the drums as part of a celebration or ceremony.
Visual Arts, K–High School Creating Generate and conceptualize artistic ideas and work	Make a list of symbols you see in your everyday life. (Traffic signs, brand logos, even emojis!) What categories can those symbols be separated into? (For example, animals, man-made, alive, nonliving, etc.)
English Language Arts, 3 rd —5 th Grade Writing Standards Text Types and Purposes Visual Arts, K—High School Creating Generate and conceptualize artistic ideas and work Visual Arts, 3 rd —6 th Grade Connecting Responses to art change depending on time and place in which it was made	Use the blank line drawing of the bronze drum to fill in your own symbols. Create a key to explain all of your symbols. Explain (either in writing or verbally) why those particular symbols were chosen. For a challenge, see if other students can guess what the symbols on their peers' drawings mean or if they can match up the bronze drum drawings to the correct students.

Additional Resources

click on the thumbnail to see each resource



Bronze Drums | Oxford Music Online. "Bronze drum."

MYSTERIOUS SYMBOLS CAST IN ANCIENT BRONZE

Tool Kit III

