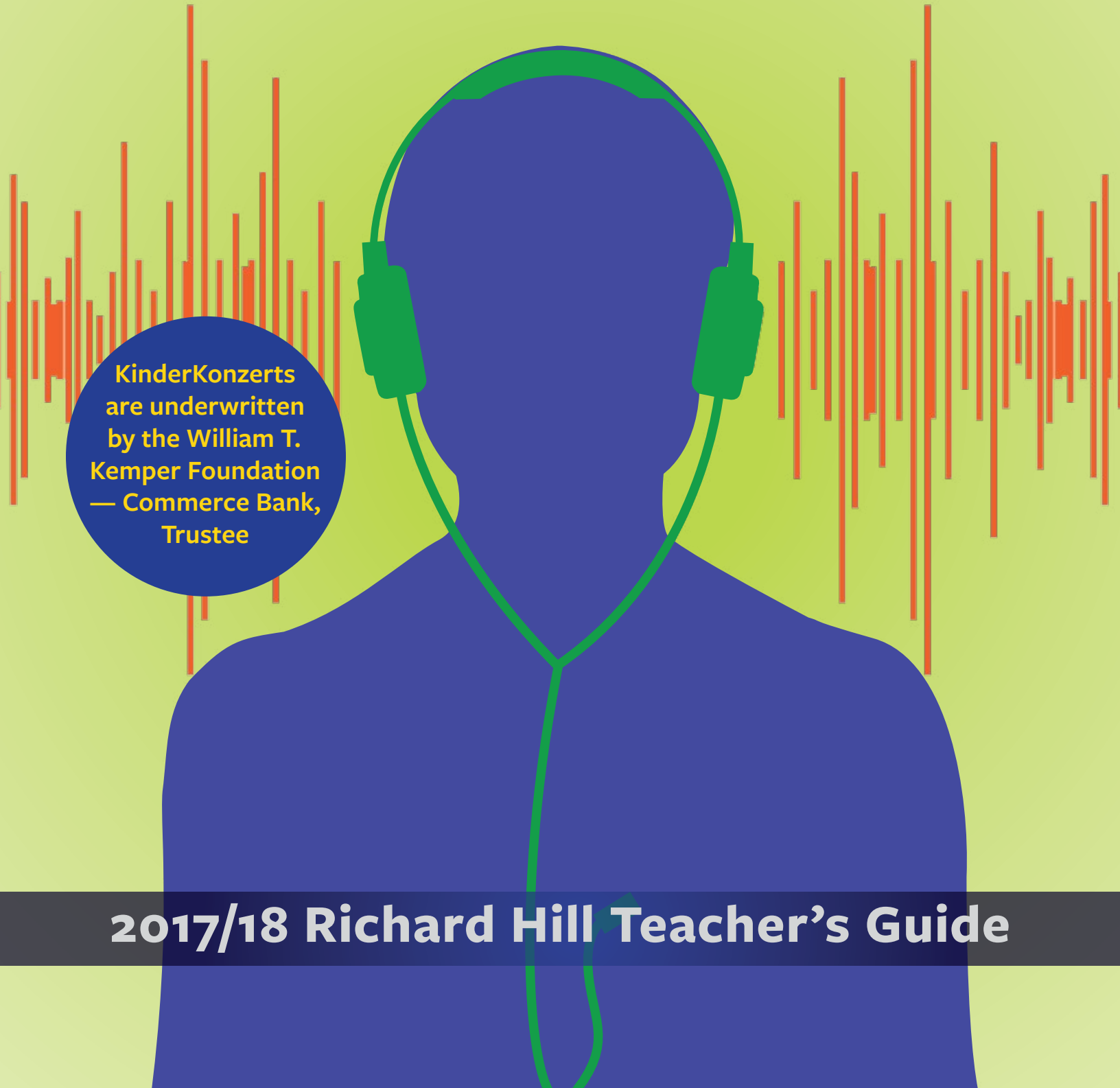
KANSAS CITY SYMPHONY

KINDERKONZERT

The SCIENCE of SOUND



KinderKonzerts are underwritten by the William T. Kemper Foundation — Commerce Bank, Trustee

2017/18 Richard Hill Teacher's Guide

About THIS GUIDE

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GREETINGS!

I look forward to seeing you at the Kansas City Symphony's KinderKonzert: *The Science of Sound with Science City's STEAM Team!* Music and science have always gone hand and hand, and we're excited to partner with Science City to bring these ideas to life in Helzberg Hall! As the concert approaches, I hope you take advantage of the materials inside this guide.

This guide is intended to be a resource for your classroom both before and after you visit the Symphony. Inside, you will find information on composers and repertoire as well as lessons and activities designed to maximize your experience at the concert. The Kansas City Symphony strives to incorporate cross-curricular elements into educational performances. *The Science of Sound* includes concepts outlined in the Kansas and Missouri state standards for Writing and Science.

Finally, I encourage you to take advantage of the Kauffman Center's Open Doors Transportation Fund, which provides transportation assistance to most schools attending the Symphony's KinderKonzerts. Missouri Schools may also apply for transportation funding through the Missouri Arts Council. Details on how to apply for transportation assistance can be found on p. 29 of this guide.

I can't wait to see you at the Symphony!

Sincerely,

Stephanie Brimhall

Stephanie Brimhall
Education Manager, Kansas City Symphony
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KinderKonzerts are part of the John and Marny Sherman Education Series and are underwritten by the William T. Kemper Foundation, Commerce Bank, Trustee. This teacher's guide and accompanying audio files are underwritten by the Estate of Richard Hill.

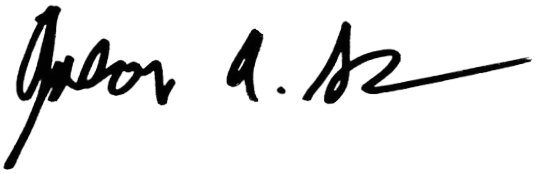
HELLO!

When I was a young boy, my two favorite subjects in school were music and science. That's why I am really excited for our KinderKonzert program this year, *The Science of Sound!* With help from our friends from Science City's *STEAM Team*, we will explore many cool concepts of sound, especially ideas related to playing our instruments in the Kansas City Symphony.

After featuring all four families of instruments in the orchestra in Shostakovich's rousing *Festive Overture,* we will examine our sense of hearing and the human ear with Beethoven's greatest piece, his Ninth Symphony. Beethoven was one of the best composers ever, as he overcame his struggle with hearing loss by relying on feeling sound vibrations to create some of his most incredible pieces.

We will look at how string players create sound by either bowing (arco) or plucking (pizzicato) their strings in Britten's "Boisterous Bouree" from *Simple Symphony*. The woodwind family will be featured in "Danse" from Prokofiev's ballet music to *Romeo and Juliet*. We'll get to check out how echoes are created while the brass play an antiphonal Canzon by Gabrieli. And we'll get to see how the percussion section can create all sorts of unique sounds by striking many different instruments (some pitched and some not) with a wide assortment of sticks and mallets.

Throughout the performance our awesome scientists from the *STEAM Team* will be conducting lots of neat experiments that will help us see and understand how sound waves work, how we can create pitches when singing or playing an instrument, and many other ideas about sound. We look forward to welcoming you to our science lab for the day, Helzberg Hall, and exploring the science of sound with you!



Jason Seber
David T. Beals III Associate Conductor, Kansas City Symphony

2017/18 KINDERKONZERT PROGRAM

SHOSTAKOVICH
Festive Overture, op. 96

BEETHOVEN
II. Molto vivace from Symphony No. 9 in D Minor, op. 125

BRITTEN
I. Boisterous Bourrée from *Simple Symphony* for String Orchestra, op. 4

PROKOFIEV
IV. Danse from *Romeo and Juliet* Suite No. 2, op. 64b

GABRIELI
Canzon septimi toni No. 2

GROFÉ
I. Father of Waters from *Mississippi Suite*

TCHAIKOVSKY
Finale from *1812 Overture*, op. 49

Listen to the Spotify playlist HERE.

About THE PROGRAM

DMITRI SHOSTAKOVICH

Dmitri Shostakovich

BORN: September 25, 1906 in St. Petersburg, Russia
DIED: August 9, 1975 in Moscow, Russia
FAMOUS WORKS: *Festive Overture,* Cello Concerto, Symphonies 5 and 10

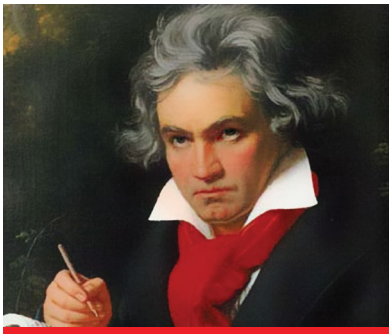
Dmitri Shostakovich was a Russian composer, pianist and teacher. His first music lessons were with his mother, a professional pianist. Shostakovich began studying at the Petrograd Conservatory in 1919, composing his first symphony as a graduation piece in 1925. A year later, the piece had been performed in Europe and the United States, and Shostakovich had become a household name.

For a period of time, Shostakovich was hailed as the hero of new Russian music. However, Shostakovich frequently suffered at the hand of the government and became a target of criticism from Soviet leader Joseph Stalin. His works were banned, he was forced to give public apologies for his music, and he was required to write music in praise of Stalin. Not following these requirements could mean arrest, imprisonment, or even death. Despite these many challenges, Shostakovich managed to write music in varying styles including 15 symphonies, 15 string quartets, 3 operas and film music.

FESTIVE OVERTURE

Shostakovich received a commission for an overture celebrating the 37th anniversary of the 1917 October Revolution just three days before the concert. The event was intended to remind people that the Soviet takeover of Russia was a good thing for Russians, and therefore needed a lively and happy piece to set the tone. Shostakovich's *Festive Overture* did just that and is filled with fast-paced, flashy and often heroic melodies.

LUDWIG VAN BEETHOVEN



Ludwig van Beethoven

BORN: December 16, 1770 in Bonn, Germany
DIED: March 26, 1827 in Vienna, Austria
FAMOUS WORKS: Symphony No. 9, *Moonlight Sonata*

Beethoven is one of the world's most celebrated composers. In his career, he composed symphonies, concerti, and a number of works for theatrical productions. Beethoven also was an accomplished pianist and composed over 30 sonatas for the instrument including the well-known "Moonlight" and "Waldstein" sonatas. At the age of 30, Beethoven began to notice some hearing loss. What began as a slight ringing in the ear eventually transformed into a loud roar, which left Beethoven almost completely deaf. He continued to conduct and compose music, relying on his lifetime of ear training and vibrations from the piano for guidance.

SYMPHONY NO. 9

Beethoven's Ninth is by far the most epic of his symphonies, both in length and the number of performers it involves. The score calls for soprano, alto, tenor and bass soloists and mixed chorus (in the finale only), and an orchestra consisting of piccolo, two flutes, two oboes, two clarinets, two bassoons, contrabassoon, four horns, two trumpets, three trombones, timpani, triangle, cymbals, bass drum and strings. The performance time is approximately 72 minutes.

Beethoven switched the traditional order of movements, placing the **scherzo** second. It gives a prominent role to the timpani and shows both humor and power.

BENJAMIN BRITTEN

Benjamin Britten

BORN: November 22, 1913 in Lowenstoft, England
DIED: December 4, 1976 in Aldeburgh, England
FAMOUS WORKS: *Young Person's Guide to the Orchestra, Four Sea Interludes*

Benjamin Britten became interested in composing music at a young age and attended the Royal College of Music to study piano and composition. After spending a few years in America, Britten returned to England in 1942. He composed a wide variety of music including operas and orchestral, choral and chamber works.

Britten's *Simple Symphony* is based entirely on material he composed before he was a teenager. Each of its four movements — "Boisterous Bourée," "Playful Pizzicato," "Sentimental Sarabande," and "Frolicsome Finale" — are based on melodies and themes he created as a child. The listener should not be fooled by the title, *Simple Symphony,* as the work is rich in creativity and enthusiasm.

SIMPLE SYMPHONY: BOISTEROUS BOURÉE

The form of Britten's *Simple Symphony* follows standard **sontata form** with the first and last movements framing a scherzo and slow movement. The first movement, "Boisterous Bourée," is an energetic dance with hints of both classical sonata and **baroque** forms. The lightness in the beginning makes way for a more turbulent middle section but eventually returns at the movement's conclusion.

SERGEI PROKOFIEV

Sergei Prokofiev

BORN: April 23, 1891 in Sontzovka, Ukraine
DIED: March 5, 1953 in Moscow, Russia
FAMOUS WORKS: *Peter and the Wolf, Romeo and Juliet,* Symphony No. 5

Sergei Prokofiev was born in Russia in 1891. His mother was a pianist, and Prokofiev was a child prodigy and virtuoso pianist who composed his first opera when he was only 12 years old. He entered the St. Petersburg Conservatory at the age of 13 and studied with noted composers including Anatol Lyadov and Nikolai Rimsky-Korsakov. After working in Russia, Prokofiev spent time in the United States and France before returning to Russia in 1936, just as the Communists were coming to power. This made composing difficult for Prokofiev and other Russian artists, including Dmitri Shostakovich.

Many composers have written music to accompany and depict Shakespeare's Romeo and Juliet; however, Sergei Prokofiev was the first to set the story as a ballet. Although most of the music was composed in 1935, the ballet was not produced until 1940 due to political and artistic setbacks. Frustrated by the delay, Prokofiev extracted several musical selections and published three orchestral suites before the ballet ever made it to the stage. These suites have since become staples in the orchestral repertoire.

The order of music in the suites does not follow the chronological order of the story; Prokofiev arranged them based on what made sense musically. When performing the suites on the concert stage, conductors often rearrange the movements to follow the story.

"DANCE" FROM ROMEO AND JULIET SUITE NO. 2

"Dance of the Five Couples" is heard near the beginning of the ballet's second act. It is set in the marketplace as a wedding procession passes by. Couples are dancing and Romeo dreams of the day he and Juliet can be married.

GIOVANNI GABRIELI

BORN: 1555 in Venice, Italy
DIED: August 12, 1612 in Venice, Italy
FAMOUS WORKS: *Sonata pian' e forte, Sacrae Symphoniae*

Giovanni Gabrieli

Little is known about Giovanni Gabrieli's early years. He was born in Italy and lived in Germany for several years, working at the court of Duke Albrecht V in Munich. After returning to Italy, he became the organist for the Scuola Grande di San Rocco in 1585, a position he held until his death. He became both the organist and principal composer of St. Mark's Cathedral in Venice, following in his uncle's footsteps.

Gabrieli greatly influenced music in the seventeenth century and served as a transitional figure between the **Renaissance** and **Baroque** eras. He became one of the first composers to write choral works including parts for instrumental ensembles, and wrote many purely instrumental works as well.

CANZON SEPTIMI TONI NO. 2

Gabrieli's *Canzon septimi toni* comes from a collection of music composed for St. Mark's Cathedral. The collection includes pieces for various combinations of trumpets and trombones which would have been placed **antiphonally** inside the cathedral. This allowed him to clearly highlight the dialogue between instruments.

FERDE GROFÉ

BORN: March 27, 1892 in New York City, NY
DIED: April 3, 1972 in Santa Monica, CA
FAMOUS WORKS: *Grand Canyon Suite, Mississippi Suite*

Ferde Grofé

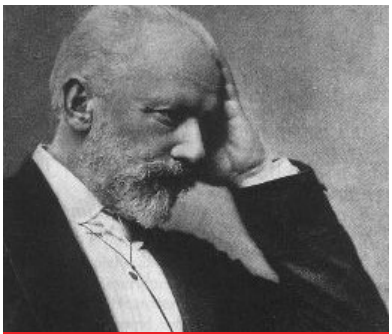
Ferde Grofé was born in New York in 1892 to a family of a musicians. After working as a truck driver, newsboy, elevator operator and bookbinder, Grofé began his career as a composer. He had a passion for **jazz** and the American landscape. Both of these influences can be heard throughout his music inspired by American settings, including suites written for Death Valley, the Grand Canyon, Hawaii, Mississippi, Niagara Falls, San Francisco and Yellowstone National Park.

"FATHER OF WATERS" FROM MISSISSIPPI SUITE

Grofé's *Mississippi Suite* was premiered in 1925 and features four movements, each celebrating various aspects of the great American river. The first movement, "Father of Waters," celebrates the northernmost part of the Mississippi River and the Native Americans who named it. "Mississippi" can be translated as "Father of Waters." The river is among the longest in North America and runs 2,350 miles from Minnesota to the Gulf of Mexico.

PYOTR ILYICH TCHAIKOVSKY

BORN: May 7, 1840 in Votkinsk, Russia
DIED: November 5, 1893 in St. Petersburg, Russia
FAMOUS WORKS: *The Nutcracker, 1812 Overture* and Symphonies 4, 5 and 6



Pyotr Ilyich Tchaikovsky

Russian composer Pyotr Ilyich Tchaikovsky is one of the most celebrated composers of classical music. He began playing piano at the age of six, but was encouraged to pursue a career outside of the arts. After attending law school and working for the Russian government, he decided to pursue his true passion in music. Tchaikovsky has created some of the most recognizable themes in all of music and is best known for his ballet scores to *Swan Lake, Sleeping Beauty and The Nutcracker.*

Continued on next page.

FINALE FROM 1812 OVERTURE

Tchaikovsky's *1812 Overture* was originally titled *The Year 1812, a Festival Overture to Mark the Consecration of the Cathedral of Christ the Savior.* The Moscow cathedral was built to commemorate the Russian defeat of Napoleon in 1812. Tchaikovsky composed the suitably patriotic work in less than a week and included the Russian Empire's national anthem, "God Save the Tsar," and the French national anthem, "La marseillaise."

The instrumentation for the piece is especially notable in that it includes cannon fire in the percussion parts. Tchaikovsky hated the piece, declaring it "very loud and noisy," but it became one of his most lucrative commissions and remains an orchestra standard to this day.

VOCABULARY

ANTIPHONAL:
Music that is performed by two semi-independent groups, often performing alternate musical phrases

BAROQUE:
The musical period following the Renaissance, extending roughly from 1600 to 1750

BOURRÉE:
A traditional French dance in fast duple time

CONSERVATORY:
A school giving instruction in one or more of the fine or dramatic arts; specifically, a school of music

JAZZ:
Music originating in New Orleans around the beginning of the 20th century and subsequently developing through various and complex styles; generally marked by propulsive rhythms, improvisation, virtuosic solos and melodic freedom

RENAISSANCE:
A time of great revival of art, literature and learning in Europe beginning in the 14th century and extending to the 17th century, marking the transition from the medieval to the modern world

SCHERZO:
A movement or passage of light or playful character, especially as the second or third movement of a sonata or a symphony

SUITE:
An ordered series of instrumental dances, in the same or related keys, commonly preceded by a prelude

THE SCIENCE OF SOUND

SOUND is made of vibrations and can be transmitted through a variety of materials, or *mediums*, including solids, liquids, gases and plasmas. The speed of sound depends upon several factors, such as temperature, pressure and the type of medium it travels through. Generally, the standard speed of sound through air is 741 mph.

Sound actually travels fastest in solids like iron and steel, slower in liquids like water, and slowest in gases like air. For example, sound waves can travel a mile through steel in only 1/3 of a second, in water 1 second, and in air 5 seconds. So sound travels through steel up to 15 times faster than air!!

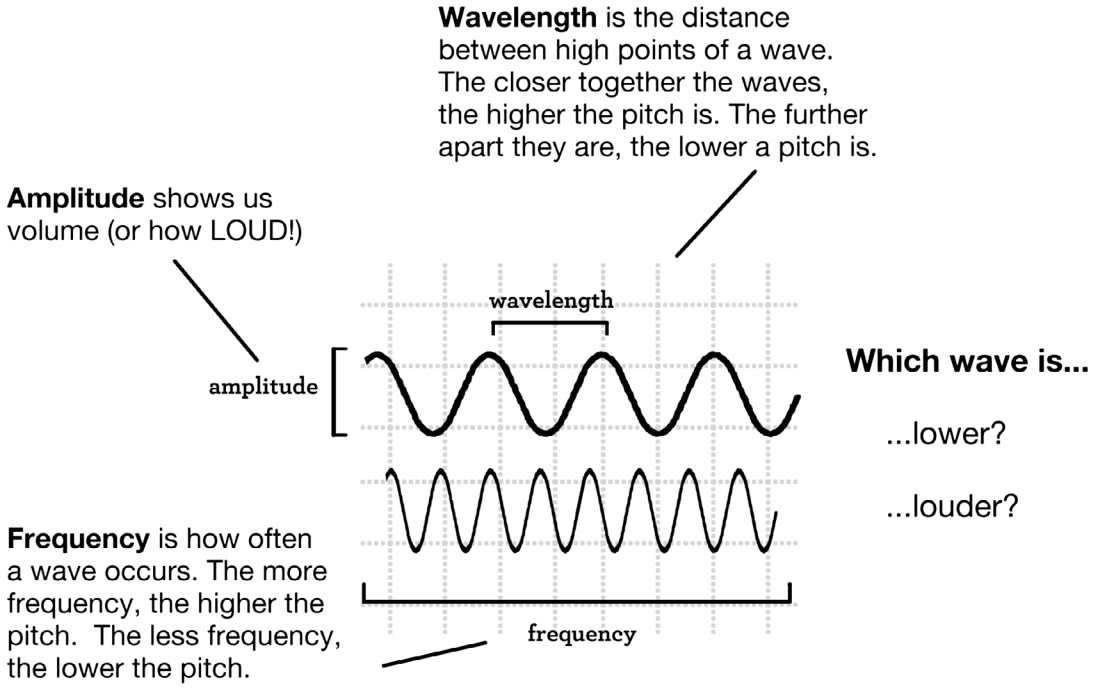
Sound can be created in many ways: the human voice, whistling, clapping, humming, amplified through musical instruments like a trumpet or tuba, fireworks and music speakers and noise from car engines, airplanes, or other machinery.

VIBRATIONS in sound refer to mechanical oscillations, like "backward and forward" or "up and down," about a fix equilibrium point. The oscillations may be periodic or random and can create a variety of sounds.

FREQUENCY is the number of periods, or regularly occurring oscillations, per unit of time. It is measured in hertz (Hz) and it is the property of sound that most determines pitch. In general the range of audible frequencies for humans ranges between 20 and 20,000 Hz. Other animals have varying frequency ranges, such as dogs between 67 and 45,000 H and dolphins hear between 75 and 150,000 Hz.

PITCH is the degree of height or depth of a tone, or sound, which depends upon the speed of the vibrations by which it is produced.

Did you know that the sounds we hear are actually waves of air? Some pitches are high and others are low.

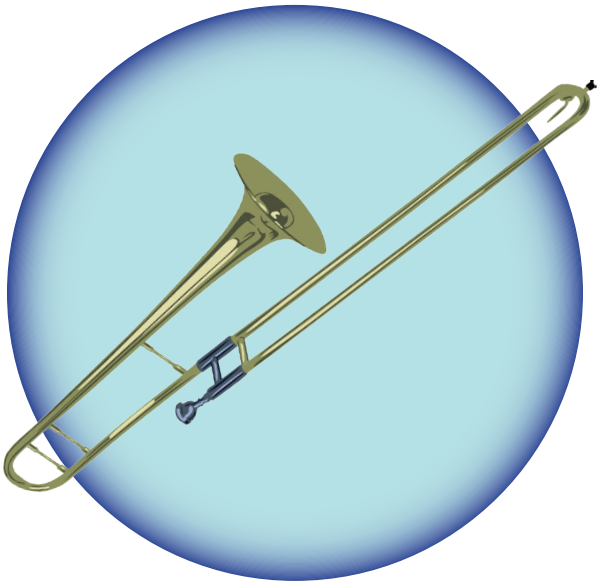


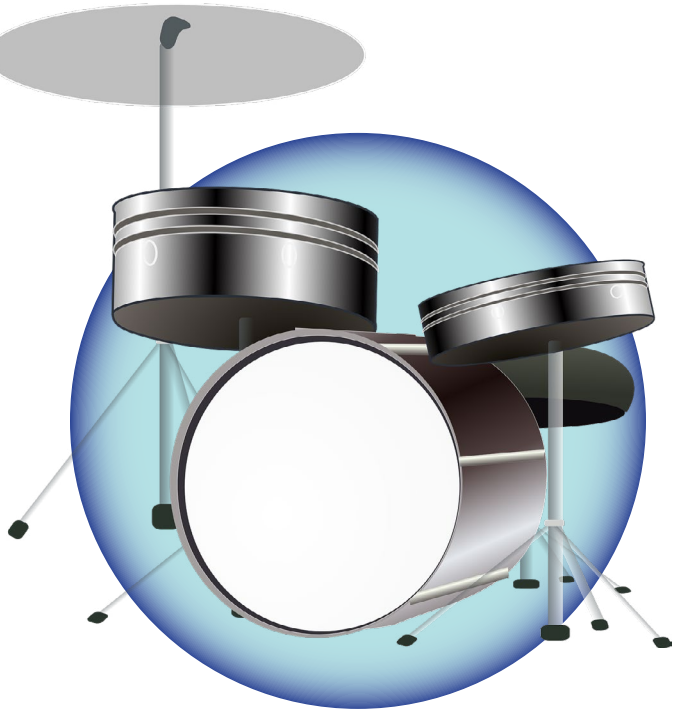
INSTRUMENT *Families*

The instruments of the orchestra can be categorized into families. Instruments in a specific family have similar traits but may sound, look, or be used slightly differently than other members of the same family. The four instrument families in an orchestra are STRINGS, WOODWINDS, BRASS and PERCUSSION.

The **STRING** family includes the violin, viola, cello and bass. Instruments in this family produce sound by vibrating strings. Musicians use two different techniques to cause the string to vibrate. One way to produce vibrations is to rub the strings with a bow. The bow is a long stick with horsehair stretched across it. When the bow is drawn across the strings, it causes the strings to vibrate which produces a sound. Another way strings vibrate is by plucking them with your finger. This technique is called pizzicato. Whether bowing or plucking, the pitch on a string instrument is changed by adjusting the length of the string. This is accomplished by putting fingers down on the string to shorten the length of the portion that is vibrating. String instruments have a very mellow, rich sound. There are many string players in an orchestra because each instrument alone does not produce a very loud sound compared to other instrument families.

The **WOODWIND** family includes the flute, clarinet, oboe and bassoon. These instruments produce sound by players blowing a vibrating column of air inside some form of tube. As the name suggests, all woodwind instruments have been made out of wood at one time in their existence. The flute has since evolved into being made of metal. All woodwind instruments create the vibrating column of air in different ways. Flutists blow across the top of an open hole. Clarinetists blow between a reed — usually a small, flat piece of bamboo — and a fixed surface. Oboists and bassoonists blow between two reeds that vibrate against each other. Woodwinds usually change the pitch of their instruments by changing the length of the tube they are blowing through by opening or closing holes using keys on their instruments. A modern orchestral woodwind section generally consists of three of each of the instruments in the family.





The **BRASS** family includes the trumpet, French horn, trombone and tuba which are all made of brass. The brass family is one of the oldest families of the orchestra. Sound is produced when the musician "buzzes" his or her lips into a cup-shaped mouthpiece to produce vibrating air. The vibrating air then travels through a long metal tube that modifies and amplifies the vibrations. In order to change pitch, brass players use two techniques. The first is to change the speed that they buzz their lips — a fast buzz produces a higher pitch and a slower buzz produces a lower pitch. They also are able to change the length of tubing — trumpet, French horn and tuba players have keys that may be pressed to lengthen or shorten the tubing and trombone players increase or decrease the length of tubing by using a slide. The brass section is generally found toward the back of the orchestra because of their ability to produce louder sounds. A modern orchestral brass section traditionally consists of four horns, two trumpets, three trombones and one tuba.

The **PERCUSSION** family is the most varied family in the orchestra. Percussion instruments include the cymbals, drums, maracas, xylophone, marimba and many more. Sound on percussion instruments is created by physically striking, rubbing or shaking either a solid material, like a metal triangle, or a membrane, like the top of a snare drum. In the past, membranes have been made of animal skins but most of today's drums use a synthetic material. There are many different kinds of percussion instruments used in an orchestra that produce many different types of sounds. They are usually used to provide rhythm for the music.

SINGING ACTIVITY: ODE TO JOY

TEACHING OBJECTIVE:
Students will learn about the vibrations of our vocal cords as they sing along with the Symphony and Beethoven's "Ode to Joy."

MATERIALS:
"Ode to Joy" melody and lyrics (See next page)

TEACHING SEQUENCE:
1. Discuss how all sound is created by vibrations

2. Discuss how the sound of our voices is created by vibrations in our vocal cords

3. Ask the students to sing a simple song, like "Twinkle, Twinkle" or "The ABC's" while gently placing one hand on their throat, allowing them to feel the vibrations as they sing.

4. Teach students the melody and lyrics to Beethoven's "Ode to Joy."

Culminating Activity:
Students will be invited to sing "Ode to Joy" during the Science of Sound concerts, led by associate conductor Jason Seber. Please note: lyrics will not be projected on a screen during the concert.

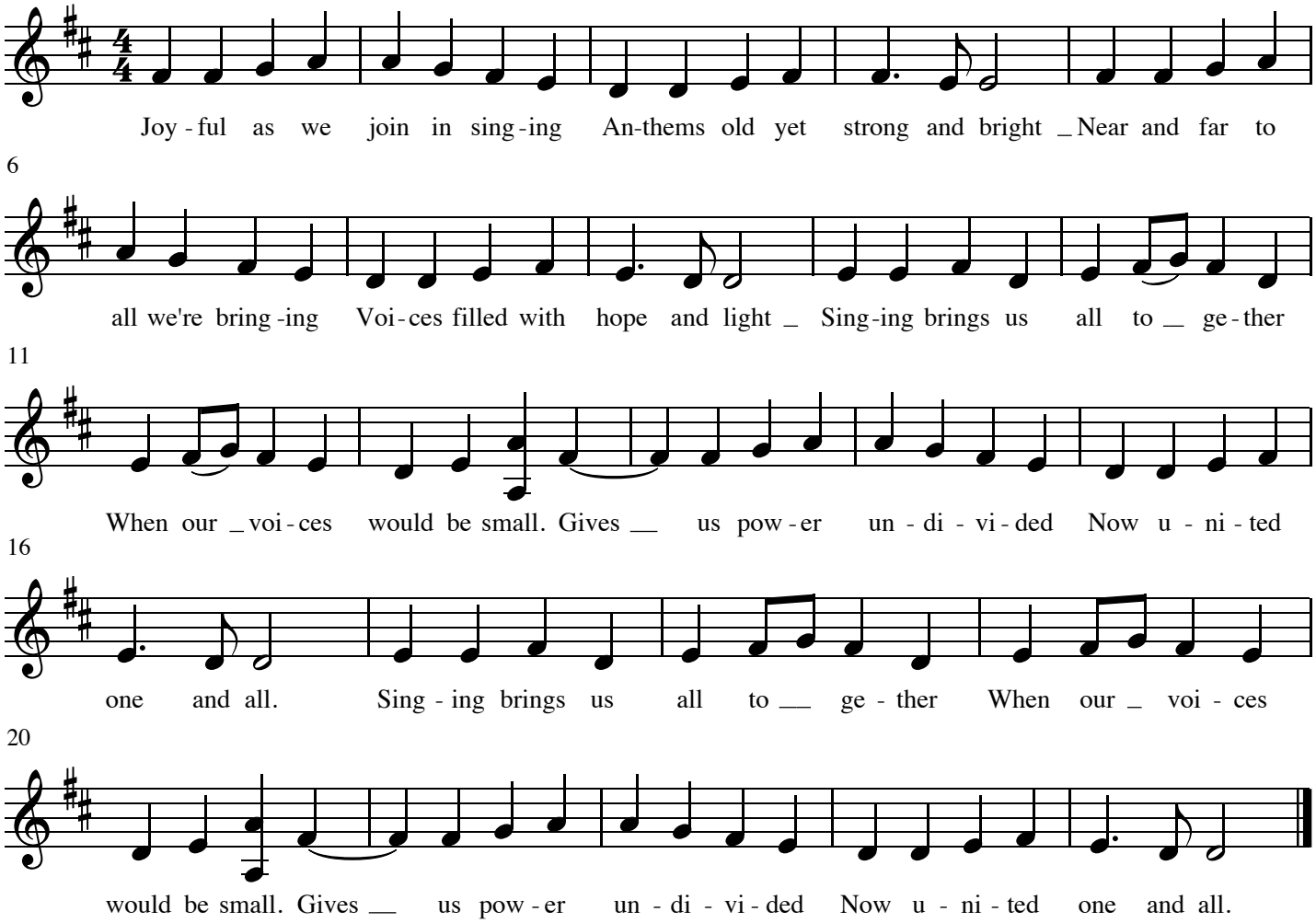
Lyrics:

Joyful as we join in singing
Anthems old yet strong and bright
Near and far to all we're bringing
Voices filled with hope and light

Singing brings us all together
When our voices would be small
Gives us power undivided
Now united one and all

"Ode to Joy"

Beethoven



MAKE YOUR OWN BUCKET BASS

TEACHING OBJECTIVE:
Students will learn about sound vibrations and string instruments with this hands-on activity.

MATERIALS:

Large metal washtub
Broomstick handle
Nylon string
Washers (2)
Nuts (2)
Eyebolt (1)
Saw
Drill

PREPARATORY ACTIVITIES:
Explain which instruments make up the string family. Discuss how strings vibrate to produce the sound.

TEACHING SEQUENCE:

1. Using a saw, carve a notch in one end of the broom handle which will fit over the raised ridge on the bottom of the washtub.

2. Drill a hole through the opposite end of the broom handle approximately 2 inches from the end.

3. Drill a hole in the center of the bottom of the washtub.

4. Place a nut on top of a washer over the hole and screw in the eyebolt.

5. Inside the washtub, place a washer and nut onto the other end of the eyebolt and securely tighten.

6. Tie one end of the string to the eyebolt.

7. Turn the washtub upside down and place the notched end of the broomstick over the ridge on the edge of the washtub.

8. Feed the other end of the string through the hole in the broomstick and pull it tight. Secure the string tightly to the broomstick.

9. Pluck the string and listen to the sound resonate in the washtub.

Extended Activity:

1. Ask the students to experiment with sound by changing the length of the string. How does this change the sound?

2. Experiment with sound by listening to bucket basses with different-sized washtubs. How does this change the sound?

Culminating Activity:
Ask students to describe the sounds created by lengthening and shortening the amount of string that vibrates. Ask students to describe the different sounds created by varying the size of the washtub. Discuss why the sounds are different.

RUBBER BAND GUITAR CUP

TEACHING OBJECTIVE:
Students will learn about sound vibrations and amplification.

MATERIALS:

Large Styrofoam cup
Rubber Band

PREPARATORY ACTIVITIES:
Discuss how vibrations produce sound.

TEACHING SEQUENCE:

1. Cut the rubber band to make it a straight line (instead of a circle).

2. Poke a hole in the bottom of the cup just large enough to thread the rubber band.

3. Thread the rubber band through the hole and tie a few knots at the other end to hold the rubber band in place.

4. Hold the cup in one hand, stretch the rubber band with your other hand, then "pluck" the rubber band. The sound you make will be loud and clear coming out of the cup, something close to what a guitar sounds like unplugged.

5. Try stretching the rubber band to different lengths, and plucking in different ways and see how the sound changes.

Culminating Activity:
Discuss how the cup assists with amplification. Discuss how plucking different lengths of the rubber band produces varying pitches.

SCREAMING CUP

TEACHING OBJECTIVE:
Students will learn about sound vibrations and amplification.

MATERIALS:

Large plastic cup
24" piece of string
Water

PREPARATORY ACTIVITIES:
Discuss how sound is made of vibrations that travel through gases, liquids and solids. As your fingers "stick and slide" across the string, vibrations occur causing the cup to vibrate. This results in the amplification of sound.

TEACHING SEQUENCE:

1. Poke a hole in the bottom of the cup just large enough to thread the piece of string.

2. Thread the string through the hole and tie a knot or two at the end of the string to hold the string in place.

3. Wet the string with water.

4. Hold the cup in one hand, pinch the string between your thumb and forefinger, squeeze tightly on the string and slide your thumb and forefinger down the string. With practice and a little patience the string will "stick and slide" between your fingers causing a "screaming" sound.

Extended Activity:
Try using larger and smaller cups and determine how this changes this sound. Does the sound get louder or softer? Higher or lower? Discuss the differences and similarities.

Culminating Activity:
Discuss how the vibrating string produces sound. Discuss how the cup assists with amplification and sound production.

MAKE YOUR OWN STRAW OBOE

TEACHING OBJECTIVE:
Students will learn about sound vibrations and double reed instruments with this hands-on activity.

MATERIALS:
Drinking Straws (straight straws work better than bendable straws)
Scissors

PREPARATORY ACTIVITIES:
Explain why oboes and bassoons are classified as double reed instruments. Discuss how air, when blown between two reeds, causes the reeds to vibrate, which produces the sound.

TEACHING SEQUENCE:
1. If you are using bendable straws, cut the straw just below the bend leaving a straight straw to work with.

2. Pinch approximately 1 inch of one end of the straw to flatten it.

3. Using scissors, cut the flattened end into a point.

4. Place the now-pointed end of the straw in your mouth taking care to cover the entire opening.

5. Covering your teeth with your upper and lower lips, gently apply pressure to the straw.

6. Blow into the straw to produce a sound.

Extended Activity:
1. Ask the students to experiment with sound by blowing fast air and then slower air. How does this change the sound?

2. Experiment with sound by listening to straw oboes of different lengths. You may even try lengthening the oboe by placing a slightly larger straw at the end. How does this change the sound?

3. Students may also cut holes in the top side of the straw oboe to create finger holes for a more realistic, "keyed" oboe.

Culminating Activity:
Ask students to compare the different sounds created by varying length, air speed, etc. Discuss why the sounds are different.

MAKE YOUR OWN HOSE HORN

TEACHING OBJECTIVE:
Students will learn about sound vibrations and brass instruments with this hands-on activity.

MATERIALS:

18”-24” length of garden hose
Small funnel
2 liter bottle (empty)
Duct tape
Scissors

PREPARATORY ACTIVITIES:
Introduce the brass family. Discuss what properties each brass instrument has that makes it a member of the brass family (trumpet, trombone, horn, tuba). Discuss how brass players vibrate their lips to produce sound.

TEACHING SEQUENCE:

1. Insert the small end of the funnel into one end of a garden hose and secure it with duct tape. This will be the “bell” end of the instrument.

2. Cut the top off of a 2 liter bottle (approximately 2”-3”). Place the larger end over the other end of the garden hose and secure it with duct tape. You may need to pad the end with duct tape before placing the bottle over the garden hose to ensure a secure connection. This will serve as the “mouthpiece” of the instrument.

3. Coil the hose so that you can hold both ends as you play.

4. Put your lips into the mouthpiece and buzz them together.

Extended Activity:

1. Ask the students to experiment with sound by blowing fast air and then slower air. How does this change the sound?

2. Experiment with sound by listening to horns of different lengths. How does this change the sound and pitch?

Culminating Activity:
Ask students to compare the different sounds created by varying length, air speed, etc. Discuss why the sounds are different.

MAKE A POPSICLE STICK HARMONICA

TEACHING OBJECTIVE:
Students will learn about using air to produce sound vibrations.

MATERIALS:

- 2 popsicle sticks
- 2 rubber bands
- 2 small pieces of foam
- 1 strip of paper

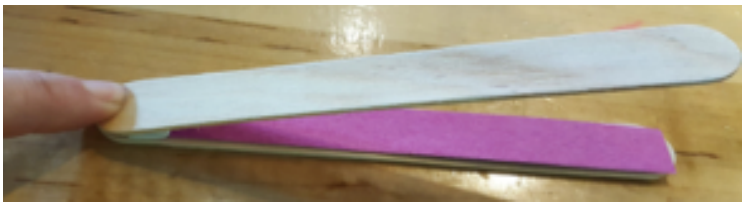
PREPARATORY ACTIVITIES:
Discuss how vibration produces sound. Discuss how moving air can produce vibrations.

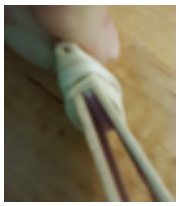
TEACHING SEQUENCE:

1. Lay the strip of paper over the Popsicle stick.

2. Fold foam piece in half and lay on TOP of the end of the paper.

3. Put the other popsicle stick on top & wrap a rubber band around it.





4. Then put the second foam piece at the other end UNDER the paper.

5. Secure the final rubber band around the open end.

6. Put your mouth lightly on the Popsicle sticks. Blow fast, and play your harmonica.

Culminating Activity:
Ask the students to experiment with the pitch of the harmonica by changing how much they squeeze their lips on the Popsicle sticks. Can they change the pitch? What else can they change? Can they play a short melody?

Thank you, Science City, for providing this activity!

EXPLORE WITH SOUNDS AT SEAQUENCE.ORG

TEACHING OBJECTIVE:
Students will explore how wave shapes create different sounds and how sounds interact to produce music.

MATERIALS:
Computers directed to the **Seaquence.org** website, or iPads with the Seaquence app loaded.
Headphones recommended for classrooms.

PREPARATORY ACTIVITIES:
Discuss how sound creates waves and how the shape of the wave changes. What we hear changes with the changes in the sound wave.

TEACHING SEQUENCE:
1. Prepare computers or iPads so that the Seaquence website or app is ready to go.

2. Explain that clicking on or off squares in the grid (called the step sequencer pattern) changes the way the creature looks and sounds.

3. Allow students to experiment with changing the step sequencer pattern and listen to the different sounds.

Extended Activity:
1. Allow students to experiment with changing other aspects of the creature.
   a. A **waveform** shows the shape of a signal at a given time, it is a representation of how the signal varies with time. The colored circles above the wave change the waveform. This will change the overall feel of the sound.

   b. An **octave** is the interval between one musical pitch and another with half or double its frequency. The + and – at the bottom right adjust the octave of the waveform. They will make the overall pitch higher or lower.

   c. A **scale** is any set of musical notes ordered by pitch. The 12 blocks under the sequencer represent the scale. Change which ones are lighted to adjust the tonality of the music.

   d. The **envelope** is the outside edge of the wave. It changes the intensity of a sound over time. Move the dots around the wave to change this pattern.

2. Add multiple creatures by clicking the "add" button on the top right of the screen. The combination of different creatures results in unique compositions that always change due to the creature's movement.

Culminating Activity:
Compose a piece of music using two or more creatures. Discuss what features they chose and why. Did they have more than one octave? Did they keep the same tonality or have different ones? Did they use all the same waveform or different waveforms?

Thank you, Science City, for providing this activity!

CONCERT ETIQUETTE

TEACHING OBJECTIVE:
Students will examine, discuss and practice appropriate concert behavior in different settings.

PREPARATORY ACTIVITIES:

1. Ask the students to list places or situations where they might be part of an audience. Solicit examples such as a rock concert, tennis match, football game, golf tournament, movie theater, etc. Create a list of answers where everyone can see them.

2. Discuss the way audience behavior in various settings would be different. Discuss how different venues or activities have different expectations for audience behavior. Discuss how an audience can positively or negatively affect the performer/athlete.

TEACHING SEQUENCE:

1. Assign a group of two or more students to act out behavior that would occur at various venues at the front of the classroom. For example, have two students pretend to be playing tennis.

2. Instruct the rest of the class to pretend that they are the audience for the event being portrayed. Instruct the "audience" to show their appreciation for the performers/athletes pretending in front of the class.

3. Critique the "audience" behavior and discuss why certain behavior was appropriate or inappropriate for the situation. Talk about audience reactions such as applause, yelling or whistling and when it is appropriate or inappropriate.

4. Ask the performers to tell the class how the "audience" behavior affected their efforts.

Culminating Activity:
Talk to the students about the upcoming Kansas City Symphony concert. Discuss with them what they should expect to happen and how they can appropriately show their appreciation for the Symphony.

Evaluation:
Were students able to understand how and why audience behavior might be different in different settings and venues? Did they understand the importance of their role as an audience member?

ORCHESTRA *Roster*

MICHAEL STERN, Music Director
JASON SEBER, David T. Beals III Associate Conductor

FIRST VIOLINS
Noah Geller, *Concertmaster*
Miller Nichols Chair
Justine Lamb-Budge,
Associate Concertmaster
Sunho Kim, *Assistant Concertmaster*
Gregory Sandomirsky,
Associate Concertmaster Emeritus
Anne-Marie Brown
Betty Chen
Anthony DeMarco
Susan Goldenberg*
Tomoko Iguchi
Dorris Dai Janssen
Chiafei Lin
Philip Marten
Vladimir Rykov
Alex Shum*

SECOND VIOLINS
Tamamo Someya Gibbs, *Principal*
Stirling Trent, *Associate Principal*
Kristin Velicer, *Assistant Principal*
Nancy Beckmann
Kathy Haid Berry
Stephanie Cathcart
Minhye Helena Choi
Mary Garcia Grant
Kevin Hao
Kazato Inouye
Rena Ishii
Francesca Manheim

VIOLAS
Christine Grossman, *Principal*
Jessica Nance, *Acting Associate Principal*
Duke Lee, *Acting Assistant Principal*
Kent Brauninger
Sean Brumble
Marvin Gruenbaum
Jenifer Houck
Bohyun Kim^▵
Matthew Rombaum

CELLOS
Mark Gibbs, *Principal*
Robert A. Kipp Chair
Susie Yang, *Associate Principal*
Richard Hill Chair
Alexander East, *Assistant Principal*
Maria Crosby
John Eadie
Lawrence Figg
Rung Lee*
Meredith McCook
Allen Probus

DOUBLE BASSES
Jeffrey Kail, *Principal*
Evan Halloin, *Associate Principal*
Brandon Mason
Caleb Quillen
Richard Ryan
Nash Tomey^

FLUTES
Michael Gordon, *Principal*
Marylou and John Dodds Turner Chair
Ford Musician Awardee
Shannon Finney, *Associate Principal*
Diane Schick

PICCOLO
Diane Schick

OBOES
Kristina Fulton, *Principal*
Shirley Bush Helzberg Chair
Alison Chung^, *Associate Principal*
Kenneth Lawrence

ENGLISH HORN
Kenneth Lawrence

CLARINETS
Raymond Santos, *Principal*
Rebecca Tobin^▵,
Acting Associate Principal
John Klinghammer

E-FLAT CLARINET
Rebecca Tobin^▵

BASS CLARINET
John Klinghammer

BASSOONS
Ann Bilderback, *Principal*
Barton P. and Mary D. Cohen Chair
Thomas DeWitt, *Associate Principal*
Marita Abner

CONTRABASSOON
Thomas DeWitt

HORNS
Alberto Suarez, *Principal*
Landon and Sarah Rowland Chair
David Sullivan, *Associate Principal*
Elizabeth Gray
David Gamble
Stephen Multer,
Associate Principal Emeritus

TRUMPETS
Julian Kaplan, *Principal*
James B. and Annabel Nutter Chair
Philip Clark, *Associate Principal*
Brian Rood

TROMBONES
Roger Oyster, *Principal*
Porter Wyatt Henderson,
Associate Principal
Adam Rainey

BASS TROMBONE
Adam Rainey

TUBA
Steven Seward, *Principal*

TIMPANI
Timothy Jepson, *Principal*

PERCUSSION
Christopher McLaurin, *Principal*
Daniel Morris^▵,
Acting Associate Principal
Joseph Petrasek‡, *Associate Principal*

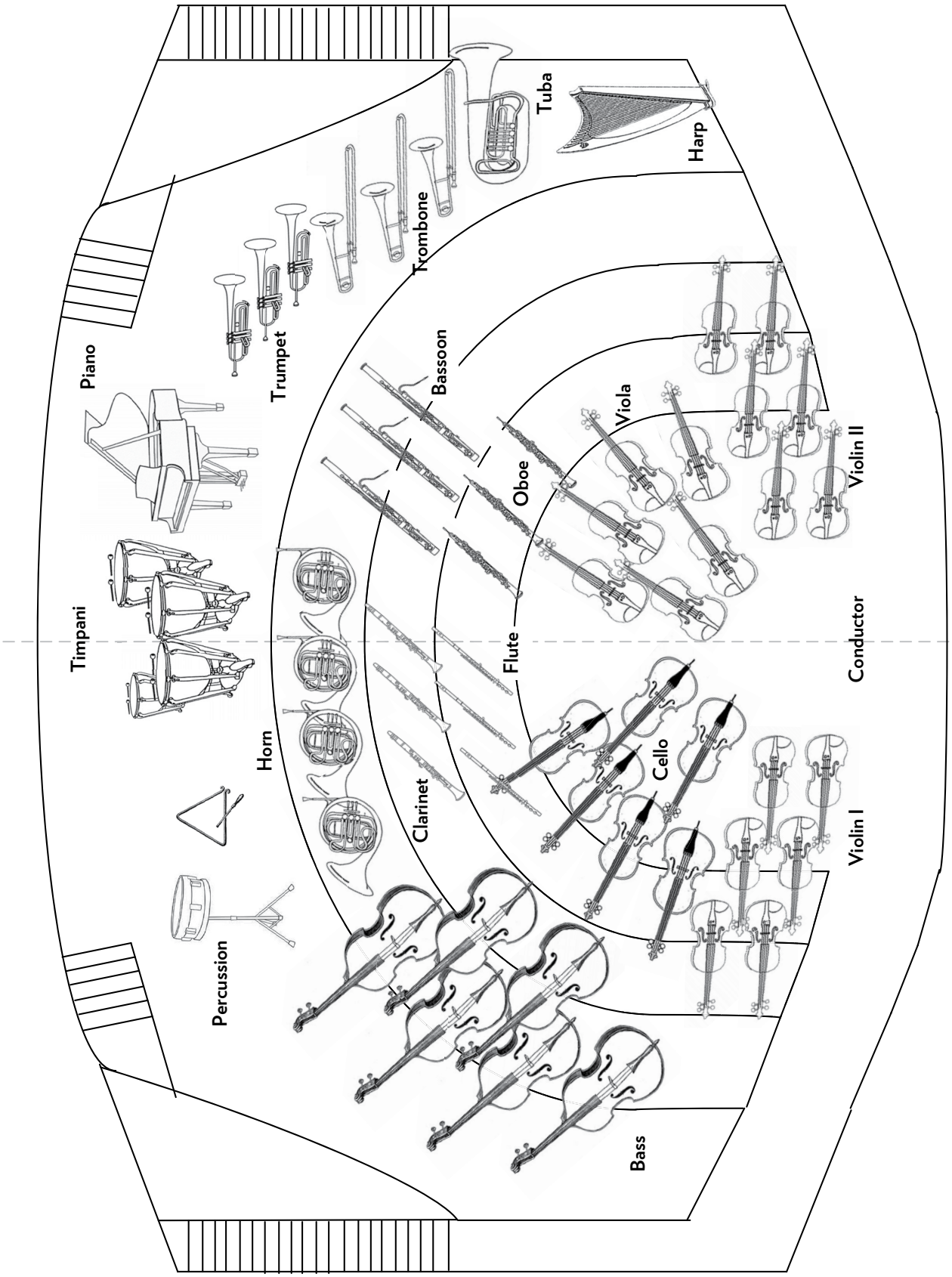
HARP
Deborah Wells Clark, *Principal*

LIBRARIANS
Elena Lence Talley, *Principal*
Fabrice Curtis

Justin White, *Personnel Manager*
Matt Henderson, *Assistant Personnel Manager*
David Tebow, *Stage Manager*
Mark Watson, *Assistant Stage Manager*

* Non-Rotating Musician
‡ On Leave of Absence
^ New Member
▵ One-Year Member

ORCHESTRA *Map*



About KANSAS CITY SYMPHONY

OUR HISTORY

Founded by R. Crosby Kemper, Jr., in 1982, the Kansas City Symphony has established itself as a major force in the cultural life of the community. Praised for performances of uncompromising standard, the orchestra is the largest in the region and enjoys a national reputation under the artistic leadership of Music Director Michael Stern.

The Kansas City Symphony also experienced impressive artistic growth through its history and under the batons of Russell Patterson (1982-1986), William McGlaughlin (1986-1997) and Anne Manson (1998-2003). Jason Seber, David T. Beals III Associate Conductor, conducts the Family, Pops and Classics Uncorked concerts. Charles Bruffy is the chorus director.

The Kansas City Symphony serves a metropolitan population of 2.1 million people. The orchestra's 80 full-time musicians are area residents and vital contributors to the artistic life of Kansas City. During its 42-week season, the Symphony performs a wide variety of subscription, educational, touring and outreach concerts. In addition, the Kansas City Symphony performs with the Lyric Opera of Kansas City and the Kansas City Ballet.

AWARD-WINNING LEADERSHIP

The Kansas City Symphony is governed by a Board of Directors under the leadership of Board Chair William M. Lyons and is administered by a full-time professional staff led by Executive Director Frank Byrne. In addition, the Kansas City Symphony benefits from the dedicated efforts of its volunteer associations.

The Symphony's four auxiliaries, with total membership of nearly 700, raise more than $1 million annually, making them some of the most successful orchestra volunteer forces in the nation.

FINANCIAL STRENGTH

The Kansas City Symphony has demonstrated a strong commitment to fiscal responsibility. From a budget of $1.5 million in its first season, the Symphony's annual operating budget has grown to more than $17 million. More than 1,000 gifts from the Board, local foundations and members of the community have created an endowment in excess of $87 million. The Symphony's annual fund campaign and other fundraising activities are integral to our continued success.

EDUCATION *and* COMMUNITY FOCUS

The vision of the Symphony's education department is to enable people of all ages in the greater Kansas City area to learn, create and become inspired through orchestral music. More than 57,000 people participate in Kansas City Symphony education programs annually. Most popular are specially programmed school concerts — KinderKonzerts, Young People's Concerts and Link Up — performed for more than 30,000 students and teachers annually.

Several thousand more are involved with the Symphony through activities including the Open Rehearsal Series, Bush and Jamie Helzberg Instrument Petting Zoo program and Charles and Virginia Clark Inside Music Series. Dozens of area student musicians participate in the Woman's City Club Charitable Foundation Young Artist Competition, where the winner is awarded a cash prize and the opportunity to perform with the Kansas City Symphony. The Symphony's Bill and Peggy Lyons Support School Music program takes the orchestra into area schools to perform a concert and all ticket sales directly benefit the school district's music department. Since the program's inception, nearly $160,000 has been generated for school music education programs. Recently, the Symphony has piloted new music education programs and partnerships, including Petite Performances for ages 0-6.

RECORDINGS *and* BROADCASTS

The Symphony has released six recordings on the Reference Recordings label — "Shakespeare's Tempest," the Grammy® Award-winning "Britten's Orchestra," an Elgar/Vaughan Williams project, "Miraculous Metamorphoses," an all-Saint-Saëns CD featuring the magnificent "Organ" Symphony, and most recently, the music of contemporary American composer Adam Schoenberg (released January 2017). Additional projects have been recorded and slated for future release, including Holst's *The Planets* (recorded January 2015) and an album featuring one-movement symphonies by Barber, Scriabin and Sibelius. The Symphony's concerts with internationally celebrated mezzo-soprano Joyce DiDonato were featured on the national PBS Summer Arts Series in July 2012. The DVD, "Homecoming: Kansas City Symphony Presents Joyce DiDonato," may be purchased on the Symphony website or by calling the Symphony box office at (816) 471-0400. The Grammy® Award-nominated audio recording of the complete performance may be downloaded from iTunes.

In addition, the Symphony has taped three nationally broadcast PBS television specials and performed on National Public Radio, including on the prestigious SymphonyCast series. Highlights of Classical Series performances are broadcast Thursdays at 9 p.m. on KCUR FM 89.3, Kansas City's National Public Radio affiliate.

About **JASON SEBER,** *David T. Beals III Associate Conductor*

Known for his affable and engaging approach, Jason Seber, David T. Beals III Associate Conductor of the Kansas City Symphony, has built a great rapport with audience members from nine to 90. After a highly successful initial season, Seber continues to lead the Symphony in nearly 70 performances each season for Classics Uncorked, Pops, Family, Screenland at the Symphony and education concerts, as well as Christmas Festival, Symphony in the Flint Hills and a multitude of other programs in the community.

Prior to his appointment with the Kansas City Symphony, Seber served as education and outreach conductor of the Louisville Orchestra and music director of the Louisville Youth Orchestra. In his three seasons with the Louisville Orchestra, he created and led many programs on the education, family, holiday, pops and Music Without Borders series and served as cover conductor for Teddy Abrams on the classics series. During his tenure with the Louisville Youth Orchestra, membership grew from 200 to more than 350 members in nine orchestras and ensembles.

Under his baton, the LYO Symphony Orchestra performed on National Public Radio's "From the Top" in the spring of 2016.

Seber previously served as assistant conductor of the Cleveland Pops Orchestra and the National Repertory Orchestra. He has recently guest conducted the Charleston (South Carolina), Colorado, Houston, Indianapolis, Mansfield (Ohio), National and Windsor (Ontario) symphonies, as well as the Cleveland Pops and the Denver Young Artists Orchestra. This season's highlights include leading the WorldStrides Honors Orchestra at the Opera House in Sydney, Australia, and return engagements with the Colorado Symphony and Houston Symphony.

Seber earned his master's degree in orchestral conducting from the Cleveland Institute of Music and his bachelor's degrees in violin performance and music education from Baldwin Wallace University. ■

About SCIENCE CITY

Science City Kansas City is a dynamic, hands-on science center featuring more than 200 individual interactive exhibits and daily programming. Kids of all ages can experience the amazing world of science firsthand through fun and engaging exhibits and programs. In addition to changing monthly themes and daily programs and activities open to all guests, the science center offers onsite curriculum-based programs to school groups (K-12), outreach programs and an onsite 8-week STEM-themed summer camp. STEM education (science, technology, engineering and math) is at the core of everything in Science City, be it exhibits, demonstrations, classes, shows, presentations or special events and programs. Annually, more than 250,000 guests visit Science City. Please visit www.sciencecity.com for more information. ■

About KAUFFMAN CENTER FOR THE PERFORMING ARTS

LOCATION
1601 BROADWAY
KANSAS CITY, MO 64108

ARRIVING BY BUS
Groups arriving by bus will be directed to the south drop-off drive. Buses should enter the Kauffman Center drop-off drive from the Wyandotte entrance on the south side of the building. The drop-off drive will be one-way running east-west. Please stay on your bus until a Kauffman Center volunteer comes to greet your group. After students have entered the building, drivers will be directed to the north side of the Kauffman Center where they will park on 16th and Central Streets.

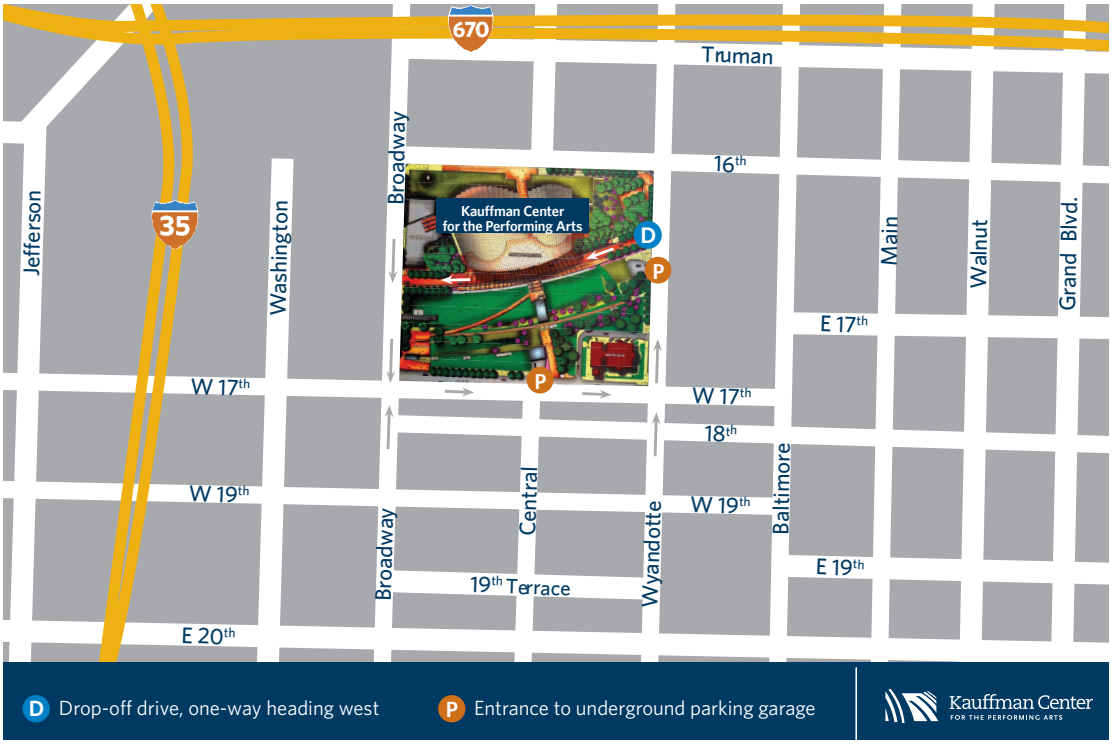
ARRIVING BY CAR
The 1,000-car Arts District garage is directly attached to the Kauffman Center just south of the building with multiple access points to surrounding streets. The cost for parking in the Arts District Garage is $3.

Numerous parking spaces are also available throughout the Crossroads District, including free parking along Central, Wyandotte, Baltimore, 17th, 18th and 19th streets.

OPEN DOORS TRANSPORTATION FUND
The Kauffman Center for the Performing Arts will again provide bus allowances for Kansas City Symphony educational performances through its Open Doors Transportation Fund. Any school in the five-county metropolitan Kansas City Area transporting at least 20 students to a Kansas City Symphony Young People's Concert, KinderKonzert, Link Up or Open Dress Rehearsal may apply. Funds will be awarded as long as they are available. Public, private, and non-traditional schools are invited to apply. Visit kauffmancenter.org for more information.

ACCESSIBILITY
Accessible seating for patrons using wheelchairs and walkers is available in most areas of Helzberg Hall, including the Parterre, Mezzanine and Lower Grand Terrace. Please consult with Education Ticketing Coordinator Crystal Mann at (816) 218-2609 to determine your best and most accessible seating options.

MISSOURI ARTS COUNCIL – BIG YELLOW SCHOOL BUS GRANTS
The Big Yellow School Bus Grant helps Missouri schools meet the transportation costs of educational field trips to arts programs in Missouri that are funded by the Missouri Arts Council. This grant is not competitive but funds are limited. For details about eligibility and application process, go to:
www.missouriartscouncil.org/education/#grants.



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