

Kansas City Young Audiences

Teacher Program Guide

The Sounds of Science

Artist: The Brookside Brass Quintet

Performance Description

Inside this guide:

Performance Description
Educational
Artist Bio
Vocabulary
List of Resources
Post-Performance Activities

Contact KCYA for more information on this and other programs.

816-531-4022
www.kcya.org

The Brookside Brass Quintet demonstrates in this performance, the physics and scientific properties of musical sound. Students will explore the ways that composers have used the varying nature of musical sound in their compositions no matter the style.

The Quintet perform several musical compositions and discusses the scientific concepts demonstrated by the music. The group shows how air and a small vibration can produce tremendous sound.

In addition to their instruments, the Quintet uses several

props including ropes, bottles, hoses, and funnels. For example, the Quintet demonstrate the concepts of pitch and frequency by blowing across bottles tuned to play *Twinkle Twinkle Little Star*, showing how the size of a vessel affects the frequency of the vibration and therefore the pitch. Building upon this lesson, the Quintet demonstrates how the size of a brass



The Brookside Brass Quintet

instruments affects the pitch and how the bell of the instrument amplifies sound.

Students will have the opportunity to ask questions at the end of the program.

Educational Objectives and Standards

Students will:

- Improve musical and general listening skills
- Draw connections between musical sounds and scientific concepts

Science:

- Knows that the pitch of a sound depends on the frequency of the vibration producing it

Music:

- Identifies specific music events (e.g., entry of oboe, change of meter, return of refrain) when listening to music

Special Points of Interest:

This performance is designed for students Grades 3-6.

The Brookside Brass Quintet also performs as a trio in the KCYA program *Penelope Popocatepetl and the Three Babirusas*.

Special REQUIREMENTS:

Five chairs; one 6' x 3' table

Artist Bio: The Brookside Brass Quintet

Stephanie Cox (trombonist and musical director) received a B.M. in Trombone Performance from UMKC in 1984. She has studied with members of the Chicago Symphony and at the Aspen Music Festival.

Stephanie is principal trombonist for the St. Joseph Symphony and the Northland Symphony. She is Instructor of Trombone at Washburn University in Topeka, KS and works as a freelance musician throughout the Kansas City area.

Bill Brower (horn) studied at the University of Kansas and the Conservatory of Music at UMKC where he received a Masters degree in Horn Per-

formance. He is currently Instructor of Horn at Washburn and Baker Universities. In addition to freelancing in the Kansas City area, Bill serves as hornist for the Washburn University Woodwind Quintet.

Barry Springer (trumpet) moved to Kansas City after spending three years as soloist with the Glenn Miller Orchestra. While completing a M.M. in Trumpet Performance at UMKC, he was a Concerto-Aria Competition winner in 1987. He received his Bachelor's Degree in Jazz Studies from Indiana University. Barry is a freelance musician and private music instructor.

Stephen Molloy (trumpet) holds a B.A. in Music from St. Cloud State in Minnesota and a M.M. in Trumpet Performance from Kansas University. Steve presently serves as Artist in Residence at Missouri Western State College and is a freelance musician in the Kansas City area.

Thomas Stein (tuba) is Assistant Professor of Tuba and Euphonium at UMKC. He received his B.M. and M.M. degrees from University of Michigan. He has extensive teaching experience and is active as a recitalist, clinician, and soloist.

Vocabulary

Acoustics: the science dealing with the nature of sound; also, the quality of sound in a concert hall.

Amplify: to make a sound louder.

Doppler effect: the way the pitch of a sound is changed if the thing making the sound is moving fast.

Frequency: the number of sound vibrations that happen in one second.

Pitch: the highness or lowness of a musical sound, depending on the frequency of the vibration causing the sound.

Resonance: having a full, deep sound.

Tone: the quality of a sound, which, for example, tells you the difference between a whistle and a buzzer.

Vibration: a rapid backward and forward movement.

Waveform: a way to draw the pattern of vibrations causing a sound.

Wavelength: the distance between the same point on any two waves of a sound.

List of Resources

BOOKS

Science Book of Sound

by Neil Ardley

Harcourt; 1st U.S. ed edition

(September 1, 1991) ISBN: 015200579X

Sound (Fun With Science)

by Terry Cash, Barbara Taylor, Kuo Kang Chen, Peter Bull

Warwick (August 1, 1989)

ISBN: 0531190641

Science For Fun: Hearing Sound

by Gary Gibson

Copper Beech (August 1, 1995)

ISBN: 1562946323

Using Sound (Designs in Science)

by Sally Morgan, Adrian Morgan

Facts on File (March 1, 1994)

ISBN: 0816029814

Post-Performance Activities

1. Discuss how these terms are interrelated: pitch, frequency, vibration sound wave, and waveform.
2. Close your eyes and listen. What sounds are around you? Write a list. What is the nearest sound you hear? The farthest away? The world provides a constant thrum of sound. Make a list of at least five sounds you hear in your a) kitchen; b) backyard; c) playground. Bring to share with the class.
3. Have one student sit at the front of the class facing forward and blindfolded.

- Classmates rattle a jar full of jelly beans in different places around the room. The blindfolded student points to where the sound is coming from. What percentage of the time were right answers given?
4. Following the concept of a wind tunnel, design your own whimsical megaphone using a tube or cone tunnel shape. Add flourishes of sculpture, color, and collage. Why does the voice project further with this aid? (Vibrations bounce off the inner side

of the tunnel.)

5. Break up into groups of 5. Using your megaphones from #3, design a sound collage that explores different pitches, tones, rhythms, and dynamics. Each person in the "Sound Quintet" will have a very different tone instrument that combines into a short sound piece.