



# artsNOW

Integrated learning solutions

## MUSIC AND ACOUSTICS THROUGH GRAPHING

Grade Band: 2-3

Content Focus: Music & Math



### LEARNING DESCRIPTION

Students will work together creatively to compose a rhythmic piece using cups, demonstrating their ability to identify and understand different sounds. Then, they will then graph the data they observe in their peers' performances. Throughout the lesson, students will apply musical skills such as improvisation, composition, listening, and playing.

### LEARNING TARGETS

Essential Questions	"I Can" Statements
How can music listening and composing support learning in other curricular areas?	I can identify high, medium, and low sounds aurally.
How can I represent musical data graphically?	I can verbally describe the impact of size on sound.



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	<p>I can create and perform an 8-beat rhythmic pattern.</p> <p>I can identify pitch elements of my peers' compositions verbally and through notation.</p> <p>I can graph data that I record.</p>
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## GEORGIA STANDARDS

Curriculum Standards	Arts Standards
<p><b>Grade 2:</b> 2.MDR.5.4 Ask questions and answer them based on gathered information, observations, and appropriate graphical displays to solve problems relevant to everyday life.</p> <p><b>Grade 3:</b> 3.MDR.5.1 Ask questions and answer them based on gathered information, observations, and appropriate graphical displays to solve problems relevant to everyday life.</p>	<p><b>Grade 2:</b> ESGM2.CR.1 Improvise melodies, variations, and accompaniments.</p> <p>ESGM2.CR.2 Compose and arrange music within specified guidelines.</p> <p>ESGM2.PR.2 Perform a varied repertoire of music on instruments, alone and with others.</p> <p>ESGM2.RE.1 Listen to, analyze, and describe music.</p> <p>ESGM2.CN.1 Connect music to the other fine arts and disciplines outside the arts.</p> <p><b>Grade 3:</b> ESGM3.CR.1 Improvise melodies, variations, and accompaniments.</p> <p>ESGM3.CR.2 Compose and arrange music within specified guidelines.</p> <p>ESGM3.PR.2 Perform a varied repertoire of music on instruments, alone and with others.</p> <p>ESGM3.RE.1 Listen to, analyze, and describe music.</p> <p>ESGM3.CN.1 Connect music to the other fine arts and disciplines outside the arts.</p>

## SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
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<p><b>Grade 2:</b> 2.MDA.8 Generate data by measuring objects in whole unit lengths and organize the data in a line plot using a horizontal scale marked in whole number units.</p> <p>2.MDA.9 Collect, organize, and represent data with up to four categories using picture graphs and bar graphs with a single-unit scale.</p> <p><b>Grade 3:</b> 3.MDA.3 Collect, organize, classify, and interpret data with multiple categories and draw a scaled picture graph and a scaled bar graph to represent the data.</p>	<p><b>Anchor Standard 1:</b> I can arrange and compose music.</p> <p><b>Anchor Standard 2:</b> I can improvise music.</p> <p><b>Anchor Standard 4:</b> I can play instruments alone and with others.</p> <p><b>Anchor Standard 6:</b> I can analyze music.</p> <p><b>Anchor Standard 9:</b> I can relate music to other arts disciplines, other subjects, and career paths.</p>
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## KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"> <li>● <u>Graphing</u> - The process of representing data or mathematical relationships visually using charts or graphs</li> <li>● <u>Bar graph</u> - A visual representation of data where rectangular bars are used to compare different categories or groups</li> <li>● <u>Line plot</u> - A type of graph that displays data along a number line, where each data point is marked with an "X" or dot above its corresponding value</li> <li>● <u>Data</u> - Facts, figures, or information collected for analysis, reference, or study</li> </ul>	<ul style="list-style-type: none"> <li>● <u>Acoustics</u> - The branch of physics that deals with sound and sound waves</li> <li>● <u>Body percussion</u> - Sounds produced by striking or scraping parts of the body; typically includes snapping, clapping, patting, and stamping</li> <li>● <u>Dynamics</u> - Volume of sound (loudness, quietness)</li> <li>● <u>Texture</u> - The thickness or thinness of sound</li> <li>● <u>Pitch</u> - The highness or lowness of sound</li> </ul>

## MATERIALS

<ul style="list-style-type: none"> <li>● Audio recording of drum composition (examples can be found on iTunes, Spotify, YouTube, etc.)</li> <li>● Sound source (computer and speakers)</li> <li>● Drums of three different sizes (improvise with other objects, such as buckets or pots, that can be used in place of a drum if you do not have drums available)</li> <li>● Plastic cups of three different sizes</li> <li>● 8-beat visual (numbers 1-8 spaced evenly)</li> </ul>
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- Pencils
- [“Pitch detective” charts](#) for each student
- “Pitch detective” visual on board

## INSTRUCTIONAL DESIGN

### Opening/Activating Strategy

**Classroom Tips:** Arrange student groups throughout the room so that they can move far enough apart during the creating process to enable careful listening and minimize distraction from other groups. Perform compositions out of sight of “audience,” so students rely on listening rather than sight to identify sounds heard.

- Play a recording of drums as students enter the room.
- Have students listen and then discuss with a partner what they heard.
- Introduce musical terms (e.g., instrument names, dynamics, pitch, texture, etc.) as students make observations.

### Work Session

- Take out three different sized drums (or buckets turned over). Demonstrate different pitches (high, medium, low) of various size drums (using the same relative force when you hit each drum).
- Ask students if they can determine the relationship between sound and drum size.
- Now, transfer these acoustical principles to various size plastic cups.
- Play a listening game with students. Out of students’ sight, perform 4- or 8-beat rhythmic patterns (or beats) on different drums and/or cups.
- Challenge students to identify what was heard (e.g., three sounds on a small drum and one sound on a medium drum).
- Have students echo the pattern, using body percussion (e.g., clap for high drum, pat for medium drum, stamp for large drum).
- Perform an 8-beat rhythmic pattern using low, medium, and/or high sounds, and have students identify what they heard (high, medium, and low).
  - Keep the patterns simple by using quarter notes (one sound for each beat) and eighth notes (two sounds on each beat only).
  - Using an 8-beat visual (see below) may be helpful to guide student responses.  
1 2 3 4 5 6 7 8
- Divide students into groups of four to six students, with each student having a cup. Have students create an 8-beat pattern using cups.
  - Remind them to include everyone in the composing and performing process.
- Distribute pencils and [“pitch detective” charts](#). While each group performs (out of the sight of their classmates), the other students will be “pitch detectives” and notate what they hear on their charts.
  - For example, using a blank 8x3 table (such as appears below), students could write an “X” in the appropriate boxes based on what they hear. The boxes below would demonstrate four high sounds, two medium sounds, and two low sounds.



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X	X	X	X				
				X	X		
						X	X

### Closing/Reflection

- Compare and contrast student compositions, discussing the differences in pitches and rhythms.
- Finally, have students graph the data that they recorded on their “pitch detective” charts.

## ASSESSMENTS

### Formative

Teachers will assess students’ understanding of the content throughout the lesson by observing students’ participation in the activator; ability to use musical vocabulary to describe music; ability to identify high, medium, and low sounds; and collaboration with group members to create an 8-beat pattern using cups.

### Summative

#### CHECKLIST

- Students can identify high, medium, and low sounds aurally.
- Students can verbally describe the impact of size on sound.
- Students can create and perform an 8-beat rhythmic pattern.
- Students can identify pitch elements of peers’ compositions verbally and through notation.
- Students can graph the data that they recorded.

## DIFFERENTIATION

### Acceleration:

- Provide students with a variety of materials (including but not limited to cardboard boxes, plastic hangers, foil, rubber bands in different sizes, etc). Ask students to build (or design) new instruments that play different pitches. Allow students to research and explore how instruments are made. Having different students research different instruments will allow for discussion on how they make different sounds.
- Combine two student compositions into a 16-beat phrase.
- Combine two student compositions simultaneously, producing a thicker texture.
- Alter dynamics and/or tempo of student compositions.
- Have students write compositions for others to perform using various notational systems.
  - Write 1-2 Xs in each cell of a 3x8 table.
  - Use other symbols (triangle, square, circle) to represent high, medium, and low sounds.
- Have students write sequential steps for generating new compositions.

### Remediation:

- When performing rhythmic patterns, have students perform a four beat pattern.



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- Group students into pairs as they complete their “pitch detective” charts.
- Make the “pitch detective” charts 4x3.

**ESOL Modifications and Adaptations:**

- Ensure that students have a clear understanding of the concepts of steady beat and pitch, along with the music vocabulary words texture, dynamics, acoustics, and body percussion prior to teaching this lesson.

**ADDITIONAL RESOURCES**

NA

*\*This integrated lesson provides differentiated ideas and activities for educators that are aligned to a sampling of standards. Standards referenced at the time of publishing may differ based on each state’s adoption of new standards.*

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