

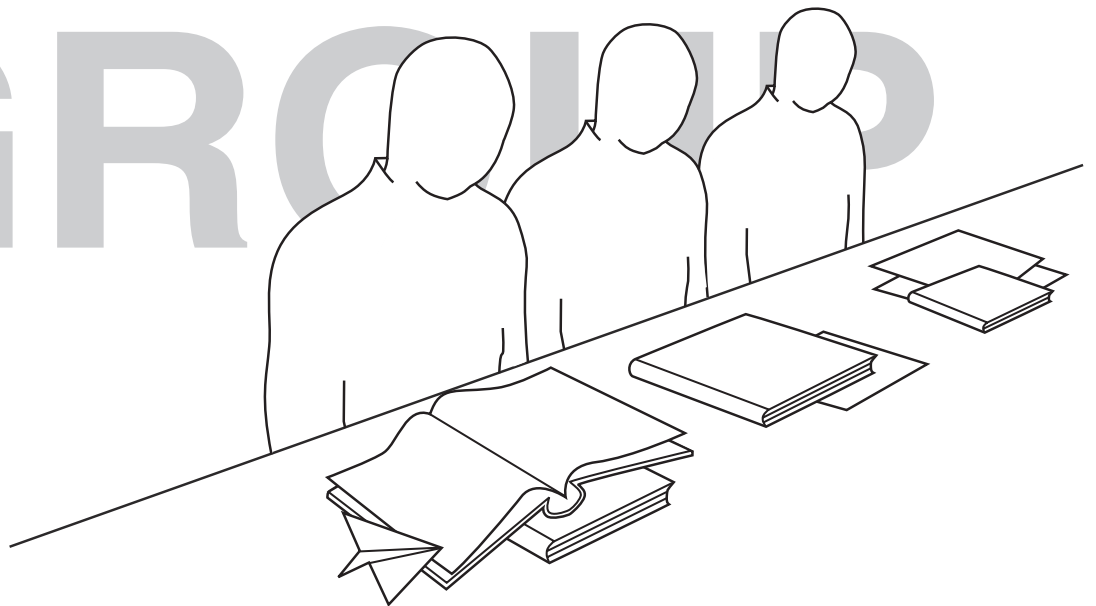
# learning lab

BLUE MAN GROUP

BLUE

MAN

GROUP



**Melodious Mathematical Inventions**

# Inventing an Instrument

GRADES 3–5

## THE BLUE MAN CONNECTION

Instruments made from unusual objects are seen and heard throughout the Blue Man performance. PVC pipe becomes a drum and cereal becomes a noisemaker. Instruments, and specifically instruments created by the Blue Man, become a springboard for creativity, interaction, and humor. This lesson will introduce the idea that at one point all instruments are the product of imagination and engineering. It will allow students to think about how they might create an instrument themselves. It will also develop the skill of self-directed learning as they conceptualize and sketch their instruments.

## LESSON SUMMARY

Begin the lesson by presenting students with 10-15 random objects. Make sure the objects represent a combination of elements, origins, sizes, and shapes. They need not, and probably should not, have an obvious musical purpose. Explain that the students will be inventing instruments. Offer a definition of invented instruments that involves adapting, combining, and/or engineering a combination of materials for a musical purpose. Arrange random objects on a table in the front of the classroom. Ask students to take 10 minutes to look at the objects and choose 5 that could be combined to be an instrument. Students decide which objects they would like to use, write down the names of those objects, and then leave objects on table. Let students know they will be able to look at their objects again, if they need to, after everyone has had a chance to look at the table. Remind students to be mindful of one another while they are looking at the table—take turns, be courteous of others who need to see the table, be good listeners, and keep hands to yourself as you move around.

Once students have chosen their objects, ask them to sketch what this instrument might look like. Creativity, not necessarily functionality, is the main thing to explore at this point. Allow each student's individual creativity to direct the creation of the instrument. Encourage students to capture the detail of the selected items as they sketch. Make sure all 5 items are represented in the sketch, and that they are all connected in some way. Allow 20 minutes for the sketches to be completed.

Next, ask students to take 15 minutes to write a brief description of what their invented instrument might sound like. Where would the instrument possibly sit in an orchestra or a band, or would it have another use? What type of music would the instrument play? If the instrument sounded like an animal, what animal would it be? If the instrument sounded like an environmental sound (train whistle, fire engine siren, or church bell, for example), what would it be?

Conclude the lesson with students sharing their sketches and brief instrument sound descriptions. This final part of the lesson should take 15 minutes.

## CONNECTING TO NATIONAL STANDARDS

Fine Arts-Music, NA-M.K-4.6- Listening to, Analyzing, and Describing Music; Visual Arts, NA-VA.K-4.1 Understanding and applying media, techniques, and processes

Language Arts- NL-ENG.K-12.5- Communication Strategies

Science- NS- K-4.2- Science and Technology



# Measuring Music

GRADES 6–8

## THE BLUE MAN CONNECTION

The Blue Man uses instruments of various sizes to create music. PVC pipe bellows. Drums pop and sizzle. The music in a Blue Man show pushes the boundaries of standard musical principals and conventions. Musical rules hold true even in the presence of edge and innovation. This lesson gives students the opportunity collect, organize, and graph data in an effort to explore the mathematical relationship between instrument length and pitch.

## LESSON SUMMARY

Set up 3-5 groups with 3-5 instruments in each. Include a variety of instruments, such as strings and brass within each group—strings with strings, brass with brass. Grouping will make measurement a bit easier. Assign a fixed-pitch instrument, such as a keyboard, bells, or a piano to half of the instrument groups. Use fix-pitch instruments to determine instrument pitches. (In order to have enough instruments, borrow instruments from your school’s orchestra and/or band, or your students’ own instruments.) Divide students into groups of 5-7 students. Assign each group a secretary to record data that will be collected by other group members. Instruct half of the groups to measure instruments and the other half of the groups to verify pitch. All students will both measure and verify pitch. They will just alternate tasks. Also remind them of the need to respect all ideas and space, and to listen to one another.

With respect to measurement, ask students to measure the sounding length of instruments: For example, on string instruments the measurement should be taken from the top of the fingerboard to the bridge. On brass instruments, the students will have to measure the complete length of all the tubing used to produce sound. To reiterate, ask half of the groups to measure first, and ask the other half of groups to verify the pitch of the instruments with fixed pitch instruments. Then switch roles so that each group both verifies pitch and measures all instruments.

When accurate length and pitch data have been collected by all groups, ask each group graph their data on a coordinate graph. Group secretaries should graph the data from each instrument on a coordinate graph to be shared with the larger group. Instruct the secretaries to graph data in order of instrument length, with length graphed on the y-axis and the pitch on the x-axis. Ask the other group members to help the secretaries make accurate graphs.

Conclude the lesson with group secretaries sharing the findings from the investigation with the entire class.

## CONNECTING TO NATIONAL STANDARDS

Fine Arts- Music, NA.9-12.6 Listening to, analyzing, and describing music

Math- NS 6-8 Measurement, Data analysis and probability

*Excerpted from* In Harmony with Education Program: Bose’s Teacher Guide

# Composing Invention

GRADES 9–12

## THE BLUE MAN CONNECTION

The Blue Man uses invented instruments to become a rock star, actor, comedian, engineer, and scientist. Invented instruments are vehicles for creativity, exploration, and discovery. Imagination defines music in the Blue Man world. New sounds sing from drums and pipes when they're pushed by the novel air of innovation. Within this vision, the person behind the pen on the sketchpad that draws the picture of a new instrument, or cuts wire that will tie pieces of recycled aluminum together, or builds a triangle out of steel, marbles, and dental floss pushes the boundaries of the musically possible. The instrument is just the beginning. The journey to making music then becomes filled with learning technique and composing music—art is an evolution. This lesson seeks to guide the creative impulse through to performance, while also reinforcing the role of community and collaboration in the creative process.

## LESSON SUMMARY

This lesson is the final lesson in a unit in which individual students conceptualize, design, gather materials, and invent an instrument. These are the requirements for the invented instrument unit: 1. Instrument must be made from materials that can make music, 2. Students write a 1-3 minute original composition for their instrument, 3. The piece must follow standard rules of composition including accurate and descriptive musical notation. (Students have already had performances of their composition taped and critiqued by the teacher.) In this lesson, they will share their compositions for the first time in small groups—this initial performance will be a step toward a final public performance. Compositions need to be legibly written and photocopied to share with group members. Divide students into groups of 3-5. Students watching the performance should follow along on the sheets of music provided by their classmates. To guide this process, feedback can be organized into a rubric that addresses basic musical concepts and performance criteria.

## CONNECTING TO NATIONAL STANDARDS

Fine Arts- Music, NA-9-12.2- Performing on instruments, alone and with others, a varied repertoire of music; NA.9-12.4- Composing and arranging music within specified guidelines

Science- NS- 9-12.5- Science and Technology