

MATERIALS & SETUP

- Beakers and/or Glass Cylinders
- Water
- Wooden Chopsticks or Popsicle Sticks
- Student Worksheet: Measured Music

CONNECTIONS TO OH STANDARDS**FINE ARTS**

- **6PR** Improvise and compose simple rhythmic and melodic phrases.
- **7RE** Create criteria and use it to critique their own performances and the performances of others.

SCIENCE

- All objects and substances in the natural world are composed of matter.
- Volume is a measure of the amount of space an object takes up. Volumes of liquids can be measured in metric units with a beaker or graduated cylinder.
- Opportunities to investigate and experiment with different methods of measuring weight and liquid volume must be provided.

Measured Music

Learning Objective: Students will expand their understanding of simple measurement and methods of recording data to create a musical instrument.

ACTIVITY (25-30 minutes)

1. Divide the class into three or four groups. Distribute four beakers or glass cylinders (labeled 1-4) to each group.
2. Explain to the students that beakers are tools used in science experiments to hold and measure liquids precisely. Explain that volume is a measure of the amount of space a liquid takes up. Point out the measurements in milliliters on the beakers. Why might it be important to have exact measurements in a science experiment?
3. Challenge each group to make four different pitches using only the beakers, the water, and the wooden stick (to gently strike the beaker and produce sound). Have the students complete their Worksheets. Discuss the relationship between volume and pitch: did more water produce a higher or lower pitch?
4. Allow the class some time to explore making sounds on their new instruments.
5. Discuss how people use pitch when they communicate (e.g. questions usually end with a higher pitch, or answers in a lower pitch; anger can be expressed loudly or even in a whisper, etc.).
6. Conduct a classroom conversation. Allow one group to improvise a short melody and have another group respond. Repeat with the other two groups.
7. Discuss the musical “experiment” as a class. Do you think it helped to have tools that allowed you to measure exact amounts of water? What would happen if you had to guess how much water to put in each beaker? How do you think beakers help scientists in an experiment?

REFLECTION

1. Did the student understand that liquid is measured by volume in milliliters?
2. Did the student understand the relationship between the volume of water in a beaker to the pitch it produced?
3. Did the students collaborate in composing a musical conversation?

Measured Music Student Worksheet

Name: _____

Date: _____

Beaker Number	Volume of Water (mL)	Rank of Pitch (lowest, low, high, highest)
Beaker #1		
Beaker #2		
Beaker #3		
Beaker #4		

What did you notice about the volume of water and pitch?

Critical Thinking: How much more water would it take to produce a higher pitch?
What about a lower pitch?

Measured Music Student Worksheet Extension

Beaker Number	Volume of Water (mL)	Tuning Fork Pitch (Hz)	Rank of Pitch (lowest, low, high, highest)
Beaker #1			
Beaker #2			
Beaker #3			
Beaker #4			