

Name: _____

class: _____

Musical Notes

Musical instruments produce sound by setting up standing waves. Those waves can be on a string or in a column of air. In this lab, you will see how you can use bottles to produce different musical notes.

Problem: How can you produce different musical notes with bottles of water?

Procedure

1. Your bottles are labeled A, B, and C.
2. Put water into the bottles according to the following guidelines:
 - A = $\frac{3}{4}$ full
 - B = $\frac{1}{2}$ full
 - C = $\frac{1}{4}$ full
3. Measure the height of the water and record it in the data table.
4. Measure the height of the column of air and record it in the data table.
5. Predict the differences in pitch you will hear if you blow across the top of each bottle. Explain your reasons for your predictions.
6. Test your prediction by blowing across the top of each bottle until you hear a sound. Listen to the sound you produce. Describe each sound in terms of pitch- low, medium, or high. Record the pitch in the data table.
7. When you gently tap the side of the bottle with a pencil, you produce another sound. Do you think the sound will be similar or different from the sound produced by blowing across the top of the bottle? Explain.

8. Test your prediction by tapping the side of each bottle until you hear a sound. Listen to the sound you produce. Describe each sound in terms of pitch- low, medium, or high. Record the pitch in the data table.

Bottle	Length of column of air	Pitched produced by blowing across top	Length of column of water	Pitch produced by tapping
A				
B				
C				

Analyze and Conclude

1. Describe how the sound is produced in Step 6.
2. Which bottle produced the highest pitch in step 6? The lowest? Was your prediction in procedure step 5 correct?
3. What caused the change in pitch from bottle to bottle in step 6?

4. Describe how the sound is produced in Step 8.

5. Which bottle produced the highest pitch in step 8? The lowest?
Was your prediction in procedure step 7 correct?

6. Compare the sounds produced by blowing across the top to tapping the side of Bottle A. What was the difference in pitch for each method of sound production for bottle A?

7. How does the length of the column of air affect the pitch when blowing across the top? When tapping?

8. How does the length of the column of water affect the pitch when blowing across the top? When tapping?