

Norwalk Symphony: DIY Water Xylophone

YOU WILL NEED

8 identical water glasses or mason jars
Measuring cups
Food coloring (optional, but fun)
Plastic, wooden and/or metal spoons
Water

STEPS

1. Arrange your 8 empty water glasses or mason jars in a straight line, close together, but not touching. Hit each one with a spoon. Do they sound the same or different?



2. Measure and pour $1 \frac{3}{4}$ cups of water into the first glass, then $1 \frac{1}{2}$ into the second, $1 \frac{1}{4}$ into the third, decreasing the amount by $\frac{1}{4}$ with each glass, leaving the last glass empty. Depending on the size of the glasses or jars you have, these amounts may vary. You can always pour out or add some water to adjust the pitches.

3. Add a drop or two of food coloring to dye the water in each glass a different color. This won't change the sound but will create a beautiful rainbow of color for your xylophone!

Try playing your xylophone with the plastic spoon first and see if you like the sound. Then try playing with the wooden spoon and the metal spoon and listen for the changes in the sounds. Which sound do you like best?

Listen to the notes. As you play, do you notice which glass or jar produces the lowest pitch? (It's the one containing the most water.) Which glass made the highest pitch? (It's the one with no water in it.)

EXPLORATION QUESTION:

Why does the pitch change with the different amounts of water in the glasses?

As you think about that question, try playing, sounding out some simple tunes like "Mary Had A Little Lamb" or "Twinkle, Twinkle Little Star."

THE SCIENCE BEHIND THE WATER XYLOPHONE:

You might remember that all music and all sounds begin with VIBRATIONS. VIBRATIONS produce SOUND WAVES that travel through the air to our ears and we can hear SOUNDS.

In the water xylophone, what is it that is vibrating?

In brass or woodwind instruments it is a column of air that is vibrating inside a "tube," as in a trumpet or a tuba, a flute or an oboe, and the longer the tube, the lower the sound – the shorter the tube, the higher the sound.

When you strike the side of the glass with a spoon, the glass vibrates. This causes the water inside the glass to vibrate. When there is a large amount of water vibrating, the sound is lower, while a smaller amount of water will vibrate less, resulting in a higher sound. That is why the glass with the most water has the lowest pitch and the empty one has the highest pitch.



Stepping Stones Museum for Children