



# Water Xylophone

## (and an extra color study)

Be a musician today! In this activity, you will be using glasses filled with water to create your own beautiful melodies. When you're done, you can create a walking rainbow!

### Why are we doing this activity?

Humans love music! Even if you don't have a "real" instrument, you can sing, you can drum on pots and pans, and now, try making a xylophone! Your xylophone will be created by filling up cups or jars with water, and making them sound beautiful together by simply adjusting how much water is in each one.

Different pitches in music are made by sound waves traveling at different speeds. When you add more water to a jar, the sound waves will travel more slowly, and you will hear the pitch change. Think about how the pitch changes are related to the speed of the sound waves.

When you are finished making music, transform your jars into a walking rainbow. You will be able to watch capillary action, which is what happens when water moves from one jar to another by traveling through a paper towel. The water levels in the jars will be the same height when you are finished!

### Supplies Needed

- 5-8 glasses or jars, as similar size/shape as possible
- Pitcher of water
- Towel
- Chopstick, spoon, butter knife, plastic spoon (any of these)
- Food coloring (optional)
- Paper towel (optional)



Actual xylophone versus water xylophone. Not as different as they appear!



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## What to do

1. Set out your glasses or jars in a row, making sure they aren't touching.
2. Tap each jar with your chopstick, spoon, or whatever tool you are using as a mallet. Listen to the sound made when you tap each jar. How similar or different is each sound?
3. Now, start filling one of the jars with water from your pitcher. What do you think will happen to the sound? Tap the jar as you fill it. How does the sound it makes change as you pour in more water?
4. Fill the other jars with water too. Vary how much you put into each jar, so that each one makes a sound with a different pitch. By carefully adjusting the amount of water that you pour into each jar, can you play a tune you know, like Hot Cross Buns or Mary Had a Little Lamb?
5. Add food coloring to your jars of water if you wish!
6. When you're finished, you can transform your water xylophone into another interesting study: Walking water! Rearrange your water xylophone into a circle, and empty alternating jars. Take a half sheet of paper towel, and roll or fold it into a strip. Then, place one end of this strip into one jar, and the other end into its neighbor. Do this to connect each jar with paper towel, and watch the water "walk" into the empty jars. What causes this? If you added food coloring, what colors of water do you see in the jars that were empty when you started?

## Want to go further?

- Think about what causes the pitch to change as you add water to each jar. What are sound waves, and how are they important to this activity?
- Are you a musician or do you know any musicians? How is your water xylophone similar to other instruments you might be familiar with?
- If you have access to a tuner or tuner app, use it to modify the pitches very precisely. How close were you to the notes before using the tuner?
- Learn more about sound waves by creating your own recordings using Audacity, a free open-source software (<https://www.audacityteam.org/>)