

STEAM SCIENCE EXPERIMENT FOR KIDS:

MUSICAL WATER GLASSES LEARNING ACTIVITY

These melodious glasses are a fun way to learn STEAM principles (Science, Technology, Engineering, Arts, and Math) by integrating Music, Math, and Science in this fun at-home learning activity.

WHAT YOU'LL NEED:

- 8 identical water glasses
- Water
- A set of measuring cups
- Red, yellow, and blue food coloring
- 1 plastic spoon
- 1 sheet of paper
- Tape
- A writing implement

1. FILL

- With your measuring cups, use the diagram below to fill each glass with the correct amount of water. From left to right, the glasses should have the following amounts:

- $14/8$ cup
- $12/8$ cup
- $10/8$ cup
- $8/8$ cup
- $6/8$ cup
- $4/8$ cup
- $2/8$ cup
- $0/8$ cup

- For a twist, try substituting regular glasses with mason jars.
- Make some of your glasses turn red, yellow, and blue by adding one drop of food coloring to each. Create one or two green glasses by adding a drop of yellow and a drop of blue. Don't add any food coloring to the empty glass.



MATH QUESTION:

- Add all the fractions together and then reduce the answer to its lowest terms.
- How much water was used to fill all 8 glasses?

2. LABEL

- Starting with the glass with the most water and working down to the glass with the least, label your jars from 1 to 8 using paper, tape and a writing implement.
- Keep your glasses in the order of most to least water.



3. PLAY

- Using a plastic spoon, gently tap each glass and listen for the sound it makes.
- Which glasses produce a lower sound? A higher sound?
- Why each glass makes a different sound: When you tap one of the glasses, the spoon creates a sound wave that travels through the water inside. The pitch of the sound (high or low) depends on the rate of the sound wave's vibration. Lower-pitched sounds come from slower vibrations, while higher-pitched sounds come from faster vibrations. The more water a glass contains, the slower the sound of the wave's vibration.

**THE GLASS WITH THE MOST WATER = SLOWEST SOUND
WAVE VIBRATIONS = LOWEST PITCH**

**THE GLASS WITH THE LEAST WATER = FASTEST SOUND
WAVE VIBRATIONS = HIGHEST PITCH**

- Once you've gotten comfortable tapping your glasses, try playing the songs below:

THIS OLD MAN (1ST VERSE)

This old man, he played one,
5 3 5 5 3 5

He played knick-knack on my thumb
6 5 4 3 2 3 4

With a knick-knack pat-ty whack, give a dog a bone,
3 4 5 1 1 1 1 1 2 3 4 5

This old man came roll-ing home.
5 2 2 4 3 2 1

HAPPY BIRTHDAY

Hap-py birth-day to you
1 1 2 1 4 3

Hap-py birth-day to you
1 1 2 1 5 4

Hap-py birth-day dear (name)
1 1 8 6 4 3 2

Hap-py birth-day to you!
1 1 2 1 5 4

MUSICAL CHALLENGE

- Create your own song!