



Musical Jars

It's easy to look at art and science as being different subjects, but much of the art we enjoy comes from science. Mixing chemicals together is how our favorite paint is made. Music is a collection of sounds created from vibrations. Imagine a guitar. When you pluck the guitar's strings, they vibrate and produce a sound that travels in waves to your ears. Our brain then turns that sound into music!

MATERIALS:

- Glass cups or glass mason jars (same shape and size)
- Water
- Food coloring or watercolor paint tablets
- Metal spoon

STEP 1: Fill each cup with an increasing amount of water (see picture above for help).

STEP 2: Add a small amount of food coloring to the cups of water. If you don't have food coloring, you can drop in the colored tablets from a watercolor paint set instead. You'll need to use the spoon to mix in the color and take out the tablets. Be sure that each cup has a different color.

STEP 3: Tap the cups with your spoon in order from empty to full of water.

STEP 4: Create your own music! Use the lines below to write down the colors of the cups you tapped.

QUESTION (ANSWER ON BACK): The empty cup makes a high-pitched sound, while the full one makes a low-pitched sound. What do you think causes this change? **HINT:** It has to do with vibration.

FUN FACT: The National Atomic Testing Museum is a Smithsonian Affiliate. You may know the Smithsonian Institute for museums like the National Museum of African American History & Culture and the National Air & Space Museum. The NATM delighted visitors with this educational activity during Smithsonian Magazine's music-themed Museum Day in 2019.

ANSWER: The more an object vibrates the higher the sound will be, just like with the cups. As the amount of water increases, the cups vibrate less and less. This is what causes the full cup to produce the lowest sound.

EMPTY = Highest Sound

FULL = Lowest Sound