

Your task is to build one instrument that can make **three** different sounds.

Step One: Get inspired!

There are so many different ways to make music in this world! We want you to make your own instrument using materials you have at home.

Sound waves are created when materials vibrate (and, conversely, sound waves can also make a material start to vibrate). There are two main qualities of sound: How **loud or quiet** a sound is (measured in decibels) as well as how **high or low** a particular sound is (its frequency or pitch, measured in hertz). Most humans can hear sound waves with a frequency between 20-20,000 hertz. Dogs, on the other hand, can hear sounds with a frequency as high as 47,000 or even 65,000 hertz! Want to learn more? Check out this video on the difference between pitch and volume, [check out this video](#).

Music instruments often are one of these three categories.

Wind Instrument

Instruments that have wind blown through them.



Percussion Instrument

Instruments that make sound when they are hit.



String Instrument

Instruments that make music with strings. Strings can be plucked (like a guitar), bowed (like a violin), or even struck (like a dulcimer)



Step Two: Choose your Materials

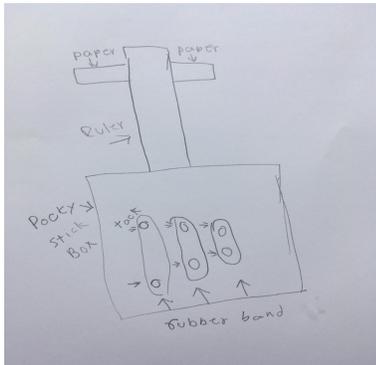
Gather your materials to make an instrument!

The materials may be...

- Hollow items like straws, cardboard boxes, cups ...
- Stretchy items like rubber bands, string...
- Items that can be shaken like rice, marbles, pebbles...
- Items that can be used to hit a surface like spoons, popsicle sticks...
- Items that can be used include tape, string, glue, scissors

As you gather your materials, think about how you might use them to make loud vs. soft sounds (i.e. change the decibels) as well as high and low frequency sounds (i.e. change the hertz).

Step Three: Designing your instrument



Start your instrument project with a drawing of your design!

Your drawing should show where the three different sounds come from with your instrument. Designs are a great way to think through your ideas!

Want a challenge? With your design, show how the sound waves (also called longitudinal waves or compression waves) travel from the instrument to someone's ear. These types of waves happen when molecules push against one another in the same direction that the wave is traveling.

Using [this video](#), play a piano and see how sound travels through the air when you play different sounds.

Step Four: Building your Instrument

Begin building your musical instrument so that it can make three sounds. Even if your instrument does not work right away, keep at it!

If you need help...

- Consider collaborating with those around you!
- Think about more or different materials you can use.
- Take a short break and give yourself time to rest and think of new ideas!

Want another challenge? Once you have created your instrument and it makes three different kinds of sounds then maybe you try and make a different type of instrument. If you make two instruments then someone else can play on the instrument and the two of you can make a song.



If you liked this challenge click the links below to find out more!

- [See Sound Waves](#) (Activity)
- [Discover Pitch with Water Xylophone](#) (Activity)
- [Play and Watch String Instrument Vibrate](#) (Activity)
- [Generation Genius: Wave Properties](#) (Video)
- Explore [KidSpace Children's Museum](#) in Pasadena

Step 5: Sharing your Instrument on Instagram or email.

We want to see your instrument! With permission from your parent, or guardian, share a picture of your instrument for our instagram page. Direct messaging or emailing an image of your challenge gives us the written consent to redistribute the image on our [website](#) or official instagram page.

Instagram: @sciencecircuswhittier **Email:** sciencecircuswhittier@gmail.com

