



Sound Waves and Musical Magic

Sound is created by vibrating objects. Sound waves can bend around corners, spread out after passing through gaps, travel through air, water and solid objects.

Wind instruments use the vibration of the air column to make music whilst string instruments produce musical notes by the vibration of strings.

All objects have a natural vibration pattern that gives a characteristic note when hit, plucked and/or blown. Below are some examples of musical instruments that can be made from the box to explore the properties of sound.

Making Maracas

1. Select a small tube, bottle or box. Make sure it has a tight fitting lid.
2. Place some beads, screws or small plastic bits in the container and seal. You only need to put in a couple of items, the items need space to move.
3. Place the lid on and shake to hear the sound. Adjust the items inside the Maraca (material, size and number) until you like the sound.
4. Use markers, contact, stickers, ribbons, fabric and thread to decorate your maraca.

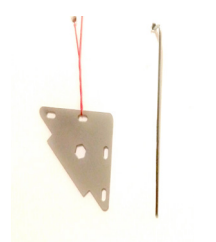


Music Waves in Water

1. Collect a series of tubes, jars or bottles all the same size.
2. Fill each container with a different amount of water.
3. Tap on the side of each container using a stick, pen or tent peg to hear the sound variation from each tube.
Tapping vibrates the plastic and water to create the sound. The smallest amount of water will give the highest note.
4. Blow across the top of each container to hear different notes.
Blowing vibrates the air column within the container. The smallest amount of air (greatest water volume) will give the highest note.

Triangles, Cymbals and Chimes

1. All these instruments are based on hitting metal shapes with either wood or metal.
2. To create cymbals clap two pieces of metal together.
3. For a triangle hang a metal shape from a piece of string and tap with a tent peg.
If you hold the triangle, many of the soundwaves will be absorbed by your hand.
4. Chimes can be made by hanging a series of metal shapes on strings so that the player can drag their hand or stick across, to make a tinkling sound.
5. Try using different materials as sticks. Wrap the end of a stick or tent peg in wadding or foam to make a softer sound.



Making a Drum

1. Choose a tube or round container
2. Select a piece of leather, canvas or thin foam that fits over the top of the drum form.
3. Use a piece of elastic, rubber bands or hairbands to pull the drum skin (hole covering) tight.
A tight drum skin makes a higher note. A smaller drum (with smaller air volume) will also make a higher note.
4. Decorate with markers, contact, stickers, ribbons and fabric.



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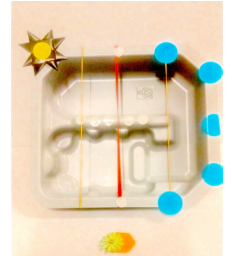


Wind Instruments

1. Cut a V in the bottom of a straw or thin tube.
2. Blow across the top of the straw to make a note
3. Adjust the note by shortening the tube or lengthening it (join a second straw) or by covering the hole at the bottom of the tube.

The V section vibrates and the sound wave is picked up by the air inside the straw which then vibrates. The longer the straw (and hence longer air column) the lower the note.

4. Try making pan pipes by cutting straws to different lengths and attaching to a piece of cardboard. You can make a scale by working out the ratio for relative pitch.



String Instruments

1. Select a box, piece of cardboard or container
2. Cut a hole in the middle of the item (like the hole in a guitar).
3. Attach string, elastic, hair bands or rubber bands to stretch across the hole and cover part of the box top. (you can use pins, tape or wrap them all the way around the container). The strings must be taught.
4. Pluck the strings like a harp, or use a small piece of plastic or metal as a guitar pick to strum the strings. You can change the note by placing your finger down on a given string to shorten the vibration area.
Longer strings will have a lower note. Thicker strings (due to slower vibrations) will also produce lower notes). Increasing the tension of the strings will create a higher pitch.
5. Decorate the instrument.



Scrapers (Guiros)

1. Guiros are a percussion instrument made by rubbing a stick, fork or tentpeg along a series of notches.
2. Try using tent pegs, pens, fingers and sticks to run over the ridges on the ridged wood pieces.
Using a tent peg you can feel the sound wave (vibrations) as you drag over the ridges.

If you come up with a great re-use or creative idea with the contents of the box please snap a photo, share to social media and tag @reversegarbageqld so we can share the idea.

Sound Facts

1. *Echos are created when sound bounces off a surface.*
2. *Sounds vary in pitch (frequency) and loudness.*
3. *Particles surrounding the vibrating source vibrate at the same frequency as the source (including your eardrum).*
4. *Sound is a longitudinal wave, moving backwards and forwards from the direction of disturbance.*
5. *The number of vibrations per second is the Frequency of the wave in Hertz.*
6. *Humans have binaural hearing (hear with both ears). This enables us to tell if a sound source is to the left or right. But we cannot determine if a sound is in front or behind us as it will reach each ear at the same time.*

The materials may need preparing or processing by adults depending on the age of the participants and what you aim to create. Some materials may require the use of strong adhesives such staples or a glue gun to connect them.

Thank you for helping Reverse Garbage Queensland to save approximately 2 tonnes (2,000kg) of industrial discards from landfill every week.

Thankyou to //blogs.deakin.edu.au/sci-enviro-ed/early-years/sound-and-music/ for inspiration and information on exploring sound.

Reverse Garbage Workshops

Did you know that Reverse Garbage Queensland runs workshops for adults & children as well as professional development for educators?

Workshops can be run at RGQ or on-site. Our workshops are fun and cover many themes plus they can be tailored to suit your group. Please call **3891 9744** or email **workshops@reversegarbageqld.com.au** for further details, to make a booking or obtain a quote.

