

Making Musical Instruments

Technology based activities designed to give primary aged students experiences in designing and making multicultural instruments



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Activity 1

What Can I Hear?

Materials:

- musical instruments, e.g. guitar, xylophone, maracas, recorder
- curtain or screen
- ping pong ball
- bowl of water
- whiteboard marker
- paperclip
- tuning forks
- glass surface or mirror

**Objective:**

To arouse interest in the range of sound-producing tools and recognise the relationship between vibrations and sound.

Skills Required:

- Students will be observing and describing sounds, touch sensations and visual effects.
- Inferring and explaining.

Background Notes:

All sounds are just vibrations in a medium, be it solid, liquid or gas. The vibrating air moves our eardrums and nerves carry the stimulus to the brain, which interprets the vibrations as meaningful sounds.

Content: Sounds can be made in a variety of ways.

Teaching Tips: Prepare and have ready six different musical instruments to play behind a curtain/screen so students can guess the sounds.

Prerecorded sounds are a possible alternative for Part 1. If materials are limited, the class can be broken into groups and rotated through Part 2. Discussing the summary together will benefit most students.

Give students an opportunity to touch the instruments gently while they are sounding to observe the vibrations.



Activity 1

What Can I Hear?



Part 1

Hidden Sounds

Your teacher will arrange some hidden sounds for you to hear.

Write down what you think the sounds are?

Sound A: _____

Sound B: _____

Sound C: _____

Sound D: _____

Sound E: _____

Sound F: _____



Part 3

Bowl of Water Experiment

You will need: •tuning fork •bowl of water

Sound a tuning fork and then touch it gently to the surface of a bowl of water.

1. What do you observe?

2. Touch the tuning fork to the water without sounding it. What do you observe now?

3. What can you infer from the difference?



Part 2

Ping Pong Ball Experiment

You will need: •musical instruments •ping pong ball

Hang a ping pong ball close to a sounding instrument. Observe carefully.

1. What do you notice? _____

2. Draw your observations. Use arrows to show where you felt the vibration.



Part 4

Paperclip Experiment

You will need: •paperclip •tuning fork
•whiteboard marker •glass surface or mirror

Attach a paperclip to a tuning fork by bending it and/or using sticky tape. Tap the tuning fork then place the paperclip prong on the surface of a glass or mirror covered in whiteboard marker. Move the prong slowly towards yourself.

1. What do you see? _____

2. Try a different tuning fork. Any difference?

3. Try hitting harder or softer. What do you notice? _____



Summarise: How do these instruments make sounds?



Activity 3

Trumpets, Trombones and Didgeridoos

Materials:

- PVC pipes (or bamboo with the divisions knocked out)
- 'Blu-tack'
- funnels
- saw
- rasp
- sandpaper

*Optional Materials

- trumpets
- trombones
- didgeridoos
- horns or concert bells



Objective:

Make simple didgeridoos and trumpets to play.

Skills:

- Experimenting (predicting, trying, observing, explaining).

Background Notes.

All these instruments produce a note by vibrating the column of air inside the tube. A small range of notes can be made by changing the tension of the lips, but a larger range can be added by either varying the tube length with a sliding extension, as in a trombone, or through the use of holes, as in a trumpet. The 'bell' on a trombone or trumpet amplifies the sound for any listener not in direct line with the end of the tube. The sound can be muted or altered in pitch or tone by the use of a hand in the bell.

Content: Vibrations make sounds. Longer vibrating objects make deeper sounds.

Teaching Tip: Prepare and cut pieces of PVC pipe. Saw various lengths, file off main irregularities with a rasp. Sand smooth and/or cover roughness with Blu-tack.

Blu-tack can be used to attach funnel to pipe. Also can be put around the blowing end to make a good seal and smooth surface. Traditional didgeridoos use beeswax for this purpose.



Activity 3

Trumpets, Trombones and Didgeridoos



Part 1

Raspberry Noises

You will need: •lips •tongue



Make a sound by vibrating your tongue.

Now make a sound by vibrating your lips?

Can you finish this statement: For anything to make a sound, it has to _____.



Part 2

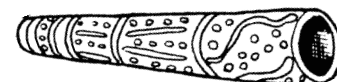
Didgeridoo

You will need: •pvc pipe

Now make the same 'raspberry noise' down a long piece of PVC pipe.

1. How is the sound changed? _____
2. What instrument have you made with the PVC pipe? _____
3. Can you produce different notes? Explain. _____
4. Can you make loud and quiet sounds? Explain. _____
5. How about animal sounds? Which one? _____

Good didgeridoo players make a continuous sound by breathing in through the nose while breathing out of the mouth - have a go!



Part 3

Trumpets and Trombones

You will need: •PVC pipe •funnel

Trumpets and trombones depend on lip vibration too but they can make a wider range of notes.

1. How do trumpets and trombones make a wide range of notes? _____

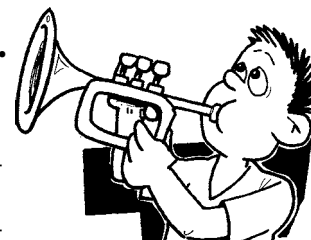
Add a funnel to the bottom of your didgeridoo and it will act like the 'bell' of a trumpet.

2. What difference does it make? _____

Trumpet players sometimes put a hand in the bell of the instrument.

Now add your hand to the funnel end of your didgeridoo.

3. What effect does this have? _____





Activity 4

Tubes and Glasses

Materials:

- drinking glasses (various sizes)
- soap
- methylated spirits
- cloth
- smooth metal rods and tubes of various sizes (hardware stores/plumbing suppliers)
- sandpaper
- hacksaw (optional)

**Objective:**

Try some novel noisemakers and experiment with varying the sound.

Skills:

- Experimenting, observing, predicting, comparing, testing, concluding.

Background Notes:

The tubes and glasses in this activity are made to vibrate by friction with the tiny ridges on your finger or the weave of the cloth.

The haired fibres of a violin bow have the same effect on violin strings, which explains the long, continuous sounds they make.

Methylated spirits removes lubricating oils which would reduce the friction between the cloth and tube.

Content: Friction can cause vibrations that can be heard as sound.

Teaching Tip: *The wine glass activity may be done as a teacher demonstration if preferred. You might like to demonstrate Part 1 using a variety of glasses. Ask students to choose notes that are higher or lower.*

Part 2: Prepare pieces of rods. Saw various lengths, file off main irregularities with a rasp, and sand smooth.



Activity 4

Tubes and Glasses



Part 1

Whining Glasses

You will need: •drinking glass •soap

Rub the rim of a glass with a wet, soapy finger to produce a note.

How would you describe the sound?



Metal or glass rods and tubes can also be used to make similar sounds to the whining glasses. Try Part 2.



Part 2

Stroked Tubes

You will need: •cloth •methylated spirit
metal or glass rods & tubes (various sizes)

- Moisten a cloth with methylated spirits.
- Grip the cloth firmly around the rod and pull downwards repeatedly. Try to time your strokes to sustain a musical note. Experiment with fast and slow strokes.
- Try different rods and tubes - which affect the pitch?

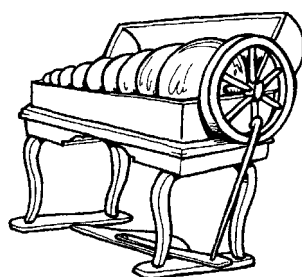
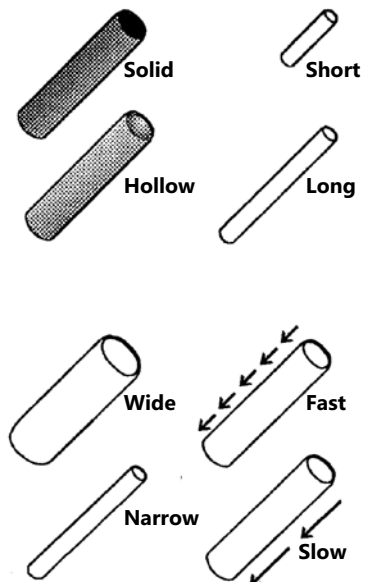
1. What do you think the methylated spirit does to help? _____

2. How could you test your idea? _____

Experiment and test your idea.

3. What happened? _____

4. So, what do you think now? _____



Research

Benjamin Franklin's
Armonica