

Everyday experimenting
for primary schools:

Bottle xylophone!



Background information

Close your eyes and listen. Depending on where you are, you will hear many different sounds and noises. Sounds are made when something vibrates.

These vibrations travel through the air to our ears. Vibrations can be made in many different ways – for example hitting, blowing, and plucking a string. Musical instruments are based on these three ways, e.g. drums (hitting), recorder (blowing), and guitar (plucking).

Let's make a bottle xylophone!

What you need

- 6 identical empty bottles, jars or tall glasses
- Metal spoon (dessert spoon)
- Jug of water
- Food colouring

What you do

1. Line up the empty bottles, leaving two centimetres between each bottle.
2. Take the spoon and strike the bottles gently one after the other. Do the bottles all make the same sound?
3. Pour increasing amounts of water into each bottle as shown in the picture.
4. Add food colouring to the water; this will help you see the different levels of water.
5. Take the spoon and gently strike the bottles one after the other. Do all the bottles make the same sound now?

What do you notice?

The less water there is in the bottle, the higher the note (higher pitch).

Why?

The glass passed on the vibrations to the water. The shorter column of water produced the higher note. Likewise the longer column of water produced the lower note.

Challenge

Can you produce a sound with the water bottles without hitting them?

Try this: blow across the top of each bottle. Note the different sounds you made. Which bottle makes the highest note now?

The bottle with the most water and least air makes the highest note this time.

Why?

When blowing across the bottles, you make the column of air in the bottles vibrate. The shorter the column of air, the faster the air vibrates, therefore the higher the note. Likewise when you blow across the bottle with the most air and least water you will produce the lowest note.

So remember:

Shorter column vibrating (air or water or string): gives higher note.

Longer column vibrating (air or water or string): gives lower note.

Follow-on activity

Change around the order of the bottles and try to produce your own tune.

More activities

For lots of more fun activities on sound, see <http://www.primaryscience.ie/>