Science Teaching Alive workshops

Sound and Pitch

Student worksheet-starter

This is not a complete worksheet – it is a suggestion that your teacher group can build on. You have probably found worksheets that were not right for your classes. Well, now you can change this one until it is right for your classes.

Activity 1 Notes with high pitch and low pitch

Write an activity based on Activity 1 in the Teachers' Notes.

Activity 2 In how many ways can you change the pitch of a note?

Write an activity based on Activity 2 in the Teachers' Notes.

You can include these tables to teach the students how to control variables:

Keep tension and length constant and vary the **thickness/weight** of the string (Activity 1)	
Thin, light string gives a	high pitch
middle weight string gives a	middle pitch
thick, heavy string gives a	low pitch

Keep thickness and tension the same, and vary the **length** (Activity 2)	
long string	low pitch
mid-length string	. . . . .
short string	. . . . .

Keep thickness and length the same, and vary the **tension** (Activity 2)	
String at low tension	. . . . .
String at mid-tension	. . . . .
String at high tension	. . . . .

The children need to learn how to state a relationship in English. For example, we can write "the pitch of the note depends on the length of the string", but this is not clear enough. **How** does it depend on the length? We have to be more precise and write something like:

"The longer the string, the lower the pitch." Or "The shorter the string, the higher the pitch." (We assume the thickness and tension are kept unchanged.)

Now try these statements of relationship:

The thicker the string, the _____ .

The greater the _____, the _____ .

What are notes and tones?

Physicists talk about **a** frequency, meaning a single vibration. But if you play a **note** on a musical instrument, the instrument vibrates with a lot of frequencies, all at the same time. That pleasant mix of frequencies we call a **tone**. So musicians talk about notes, tones and pitch and physicists talk about frequencies.

Ask the students to make string instruments that will give them high and low notes

On the next page you see some pictures of instruments from various parts of the world, and one that is easy to make with kitchen equipment. The purpose of these pictures is to give students ideas for their own instruments, or to remind them of instruments they have seen. Print a copy of this page and put it where all the students can see it.

You will need to provide them with some fishing-line, strings of different thickness or thin wire. They will also need tools for cutting cardboard and making holes in various materials.

Figure 1 *An* uhadi *from South Africa. It is a bow with a calabash as a resonator. To play an* uhadi*, you stroke the stick across the string. The calabash vibrates and makes the sound louder .*

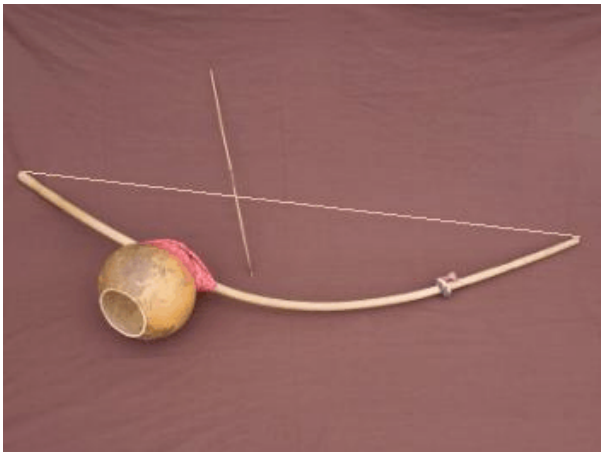

Figure 2 *A bow instrument from Nigeria. The man is plucking the string with his right hand. In his left hand he has a short stick that he uses to change the vibrating length of the string. The string vibrates in his mouth, and he changes the shape of his mouth to get different notes and tones from the string.*

Figure 3 *This instrument has a single string. The player strokes a small bow across the string to make it vibrate. The round part of the instrument is the resonator; it has a thin skin stretched over it, and the skin vibrates. This makes the sound louder.*

You can use a cardboard box with paper over it to make a resonator.

Figure 4 *This instrument uses a bucket as a resonator. The broomstick presses on the bucket and the string is fastened to the bucket. The player can get low tones from the bucket; he can also get higher tones by moving the broomstick and pulling the string tighter.*

You can use a cardboard box instead of a bucket.