

## Task: He Pouaka Pakakū — Banjo Boxes

Approach: One to one

Focus: Sound generation and transmission

Resources: "Banjo box", coloured and brown rubber bands, 2 pieces of dowel, picture

Kupu: hererapa = rubberband    whaikano = coloured    autangi = musical instrument    puare = opening/hole

### Questions / instructions:

Ko te kaupapa o tēnei mahi, he āta whakaaro ki tēnei mea te oro, me te whakaputa oro.

Tuatahi, māku e hanga tētahi pakakū māmā.

**Waihotia te pouaka, kia rua ngā hererapa, kia rua hoki ngā poro rākau ki te tēpu. Hangaia he pakakū, ka whakamārama ai ...**

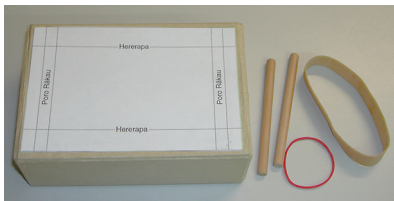
Koinei ngā rauemi hei hanga i tētahi pakakū māmā. Kia noho whāroa ngā hererapa ki te pouaka. Kāua e pā tētahi hererapa ki tētahi. Kātahi ka whakamau i ngā rākau ki raro i ngā hererapa kia pātata atu ki ngā pito o te pouaka.

In this activity we'll be thinking about sounds and how they're made.

First I'm going to make a simple banjo.

**Place the box, two rubber bands and two pieces of dowing on the table. Teacher makes banjo box, telling the student.....**

These are the materials I'll use to make a simple banjo. I put the rubber bands around the box lengthwise. I make sure the two rubber bands are not touching each other. Then I put the pieces of wood under the rubber bands near the ends of the box.



**Kia oti te pakakū te hanga, ka hoatu ki te ākongā.**

Māu e āta whakatangi ia hererapa, ka āta whakarongo ki ngā oro.

**Tukuna te ākongā kia tūhura i tēnei mahi.**

**Once the banjo has been made give it to the student.**

Now I would like you to pluck each of the rubber bands and listen carefully to the sounds the two rubber bands make.

**Allow time for student to experiment.**



% responses

1. He aha ētahi kōrero hei whakamārama i ngā oro?

HE ĀWHINA: *He aha ngā rerekētanga o ngā oro?*

What can you tell me about the sounds?

PROMPT: *What is different about them?*

coloured band makes higher sound/pitch

% responses

68

**Ki te kore te ākongā i aro he teitei ake te oro o te hererapa whai kano, māu tonu e whakaari, ka kōrero "He teitei ake te oro o te hererapa whai kano i te hererapa ura".**

**If the student didn't notice that the coloured rubber band made a higher sound than the brown rubber band, demonstrate and say, "The coloured rubber band makes a higher sound than the brown one".**

2. Tēna, whakamāramahia mai, he aha i teitei ake ai te oro o te hererapa ura?

Try to explain why the coloured rubber band made a higher sound.

**Explanation:**

*[coloured band thinner/lighter;  
coloured band stretched more tightly]*

included both ideas

2

included thickness/mass

86

included tension/tightness

0

3. Whakamāramahia mai, ka pēhea nei te oro e tae mai ai ki ō tātou taringa, mai i te pakakū?

Try to explain how the sound gets from the rubber band to our ears.

band makes vibrations in air which travel to ears and are heard

12

vaguely mentioned air vibrations

22

4. Ki tōu whakaaro, ka pēhea ngā oro o ngā hererapa mēnā ka tangohia atu ngā poro rākau?

HE ĀWHINA: *Ka pēhea nei te rerekē o ngā oro?*

What do you think would happen to the rubber band sounds if we took the pieces of wood out?

PROMPT: *In what way might it sound different?*

sound will not ring out properly, or will stop quickly

63

Tēnā, me tango atu ngā poro rākau, ka whakamātau ai.

**Tangohia ngā poro rākau.**

Let's take out the pieces of wood and see what happens.

**Remove pieces of wood.**

5. He pehea nei te āhua o ngā oro o ngā hererapa ināianeī?

What do you notice about the sounds the rubber bands make now?

sound does not ring out properly or stops quickly

34

difference in pitch (lower)

12

6. Whakamāramahia mai he aha i rereke ai ngā oro ina tangohia atu ngā poro rākau.

Try to explain why the sounds are different when the pieces of wood are taken out.

stops bands from vibrating properly

61



**Commentary:**

A majority of students succeeded with most components of this task, but few understood how sound is transmitted by air.

**Whakaaturia ngā pikitia o ngā autangi.**



He autangi kei roto i tēnei pikitia. He puare kei ngā autangi katoa.

**Show picture of stringed instruments.**

This picture shows some stringed instruments. Notice that they all have a hole.

7. Ki tōu whakaaro, he aha te take o te puare o ēnei autangi?

Why do you think these instruments have holes in them?

open cavity allows sound to resonate and amplifies sound

18

lets sound in/make sound louder

42

**Total score:** 11–13

4

8–10

33

5–7

40

2–4

19

0–1

4