



Topic: Investigating sound

Examining sound

Lesson concepts

- A Sound is produced by a range of sources and can be sensed
- Science involves asking questions and describing changes
- A People use science in their daily lives
- Questions can be responded to, and predictions made
- A Investigations can explore and answer questions
- Observations can be collected and recorded
- Observations can be compared with predictions
- Observations can be compared with others
- A Observations and ideas can be represented and communicated

Today students will:

- ▶ manipulate objects to produce a range of sounds
- ▶ understand that the properties of sound (such as pitch or loudness) produced by an object can be changed.

Resources

Digital

Video — Ekasup Band, Vanuatu (1:50)

Sheets

Sheet 1 — Word cards (cut out, keep for future lessons)

Sheet 6 — Investigating sound

Sheet 7 — Recording sound observations

Find and prepare

Ruler twang: ruler, a hard flat surface, like a desk or table

Straw pan pipes: three drinking straws, adhesive tape

Water xylophone: five jars/glasses, jug of water, metal spoon

Rubber band guitar: empty boxes/plastic containers (for example: tissue box, takeaway food container, tube), 8–10 rubber bands

Exercise book

Key terms

For definitions and explanations of terms, please see the [Glossary](#).

Learning alerts

Be aware of students describing sound using prior knowledge rather than actual observations.

Suggested next steps for learning

Explain to students that they need to describe what they have observed.

Lesson

Revise learning about sound

Say to students

‘ In our last Science lesson, we began to examine sound. Let’s see if you can recall the main ideas. ’

Focus questions

Q. *What senses can we use to observe sound?*

A. Hearing, sight and touch.

Q. *What are some actions that produce sound?*

A. For example: Striking/hitting, shaking, plucking, blowing, pressing, scraping, and squeezing.

Q. *What are some words we can use to describe what a sound is like?*

A. Loud, soft, fast, slow, high, and low.

Q. *Name some ways we use sound in our lives.*

A. For example: To talk to one another, hearing warning sounds and alarms, music and TV for our enjoyment, to know if something is working properly, for example: a car.

Examine properties of sound to suit a purpose

Say to students

‘ Sound is such a big part of our everyday lives that it is easy to not think about it too much. But there are scientists and other people who study sound very closely as part of their jobs. For example, scientists are often involved in observing how loud noise is for the people working in or living near a noisy workplace, like an airport or a factory. There are also scientists who help people with damaged hearing by developing things like hearing aids. ’

Say to students

When a movie is being made there are many people involved in creating the music and the sound effects for the movie. Without these sounds, the movies would be very boring. They carefully choose music and sounds that perfectly match what is happening in the movie.

I am going to tell you some situations and I want you to describe to me the type of sound you would recommend if you were asked to design something.

Focus questions

Q. *What type of sound would you recommend for the design of a baby mobile?*

A. For example: Soft, slow, musical sounds.

Q. *What type of sound would you recommend for the design of a fire alarm?*

A. For example: Very loud, long, high, same sound over and over.

Q. *The people who designed the sounds at traffic lights for pedestrians so they can cross safely thought very carefully. They were particularly thinking about visually-impaired people. Tell me what type of sounds they use to let people know when to wait and when to go.*

A. For example: While people are waiting the sound is a bit soft, a slow, low beep. When it is safe to walk the sound becomes louder and faster and is a higher sound.

Investigate ways to change the sound produced by an object

Say to students

We are now going to investigate how we can change the sound made by an object.

We are going to conduct some investigations and make changes to sound. As we do this we will ask 'What would happen if?' questions and make predictions before we investigate. Then we will describe what we observe. We will use some word cards to help.

1. Display and read aloud the word cards *pitch, high, low, medium, volume, loud, soft, speed, fast* and *slow* cut from **Sheet 1** — [Word cards](#).
2. Open **Sheet 6** — [Investigating sound](#) and use it to complete the following investigations:

Investigation 1: Ruler twang



Note

As you move the ruler off the table, you will notice that the ruler is more flexible. When you flick the end, it vibrates more slowly, so the sound is a lower pitch. When you pull the ruler further onto the table, it vibrates faster and the sound is higher. You can also change the sound by flicking the ruler harder or softer.

Investigation 2: Straw pan pipes



Note

As you blow, you create a column of vibrating air in each straw. As the air moves inside the tube it creates sound. If we change the length of the tube, we change the length of the column of air and also the sound. The longer the tube, the lower the sound. We can also change the sound by blowing harder or softer and faster or slower.

Investigation 3: Water xylophone



Note

When you tap the glass, you are causing the glass to vibrate. The more water in the glass, the slower the glass will vibrate, so the pitch will sound lower. With less water, the glass vibrates faster, so the pitch is higher. We can also change the sound by tapping harder, softer, faster, slower.

Investigation 4: Rubber band guitar



Note

The size and shape of the boxes affect how tightly or loosely the bands are stretched. The sound is caused by the vibration of the rubber band. If the band is stretched tight it vibrates faster and makes a higher sound. If the rubber band is loosely stretched, it will vibrate more slowly and make a lower sound. We can also change the sound by plucking the bands harder or softer.

Say to students

‘ We have learned a lot through our investigations about making changes to sound. You are now going to choose one of the investigations and record your observations. I will read through the questions with you. ’

3. Open **Sheet 7** — [Recording sound observations](#) and support the student to record their observations.

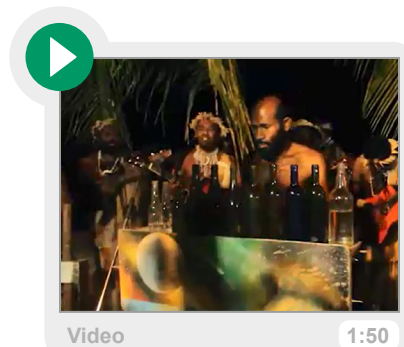
Consider how music is produced

Say to students

‘ To finish this lesson, we are going to view a video of some people who are using the science we have just investigated to play music. ’

4. Display and view the **Video — Ekasup Band, Vanuatu**.

This video shows some people from Erakor Island village in Vanuatu, playing some of the instruments which they have made from everyday objects.



Murphy, G. Ekasup Band, Vanuatu https://youtube.com/watch?v=uJvGOVWA_LE CC BY creativecommons.org/licenses/by/3.0/

Focus question

Q. *What do you notice is the same about the instruments being played in the video and the investigations we have just done?*

A. For example: One man is tapping some bottles of water which uses the same science as our xylophone investigation. Another is playing an instrument made from a box and a pole and string. It is like the rubber band guitar investigation. They are also using different lengths of bamboo pipe which is like the straw pipes we investigated.

Say to students

‘ The way people make music involves them changing the pitch, the volume and the speed of the sounds they make. When they combine with other instruments in a band or an orchestra the sound science is amazing. ’