

- 4 a Zara and Sofia also listened to sound through a woollen hat.
The loudness of the sound was 3.5dB.
Draw another bar on the bar chart to show this.
- b Is wool a solid, a liquid or a gas?

- 5 Which kinds of materials on the bar chart do sounds travel through best?

Challenge

Zara and Sofia investigated how well sound travels through different materials. They listened to the sound of a clock ticking through the materials to see how loud it was. These are their results:

Material	Distance from clock in cm	Loudness of sound
Plastic	0	✓✓✓✓
Wood	0	✓✓✓✓✓
Water	2	✓
Air	0	✓
Cardboard	5	✓✓

- 6 Identify the control, independent and dependent variables.

- 7 Which material did sound travel through best?

- 8 Which material(s) did sound travel through worst?

9 Do you think Zara and Sofia's results are accurate? Explain why or why not.

10 What should Zara and Sofia do to get fair and accurate results?

Practice

Marcus and his friends used a rating system of ticks to record the volume of sounds they heard during their lunch break. These are their results.

Sound	Loudness
Talking	✓✓
Laughing	✓✓✓
Shouting	✓✓✓✓
Music playing	✓✓✓
School bell ringing	✓✓✓✓✓



- 5 Draw a bar chart of the results. Remember to give your bar chart a heading and clearly label the bars and the axes.

- 6 How could the boys have made more accurate measurements?

- 7 Identify the control, independent and dependent variables.

- 8 Which sound was the quietest?

9 How are the vibrations different as a sound gets quieter?

10 Describe how pitch vibrations are different to volume vibrations.

Challenge

Zara and Sofia measured the sound volume of a clock ticking through different materials. These are their results.

Material	Sound in dB
Water	45
Metal	65
Wood	60
Glass	50
Air	40



11 Draw a bar chart of the results.

12 a Which material did sound travel through best?

b Explain why sound travels well through this material.

13 Identify the control, independent and dependent variables in this investigation.

14 a Write a conclusion based on the data.

b How could Zara and Sofia get more evidence to support their conclusion?

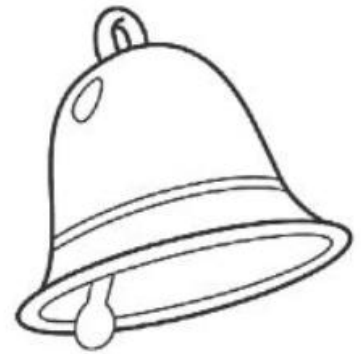
Focus

- 1 What is volume of sound?

- 2 Give an example of a loud sound.

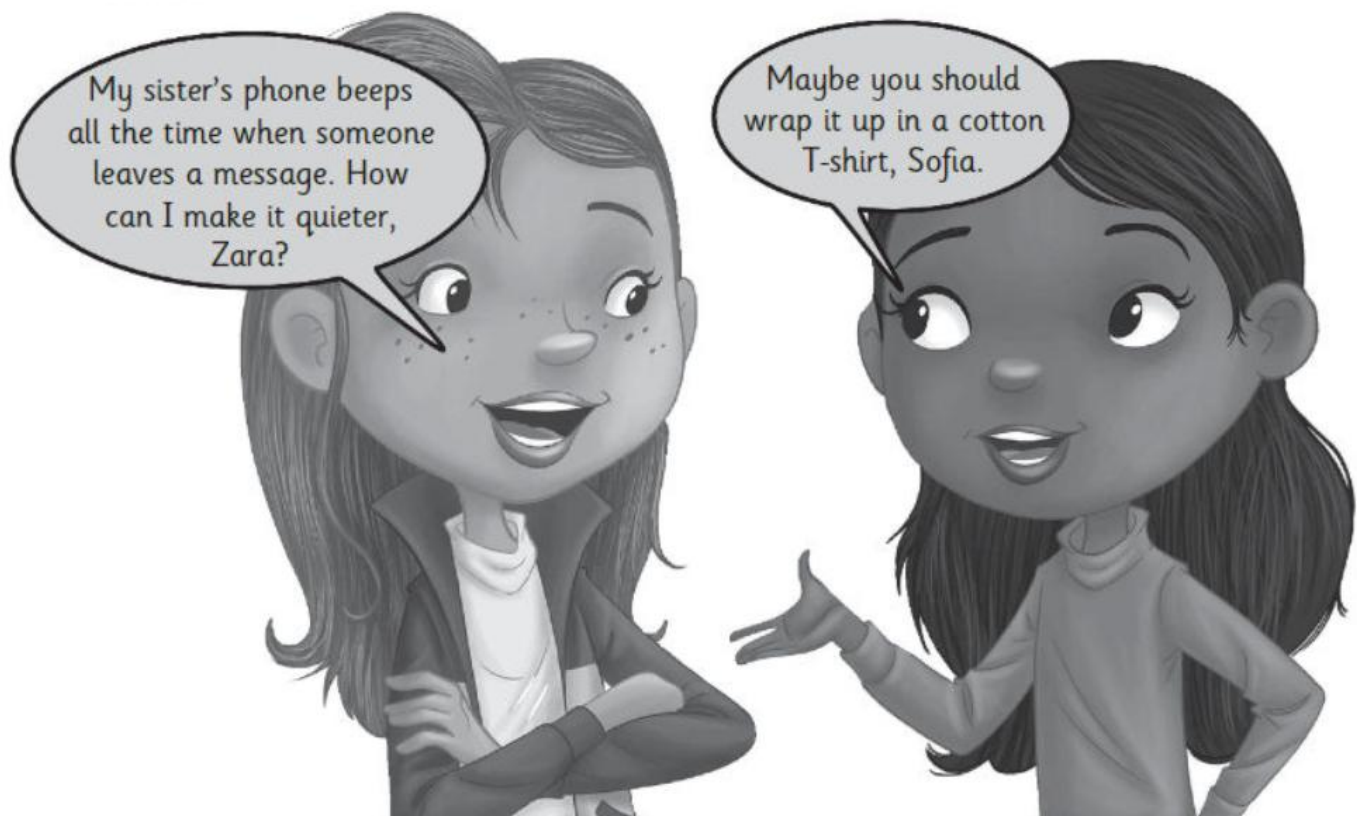
- 3 Give an example of a quiet sound.

- 4 How does the bell in the picture make a sound?



- 5 Suggest as many ways you can think of to make the sound of the bell ringing louder. You can write or draw your ideas.

Practice



- 6 a Which material did Zara suggest to muffle the sound of the phone?

- b List three other materials that Zara and Sofia could test.

- 7 Write down another piece of equipment that they will need to make it a fair test besides the materials to test and the mobile phone.

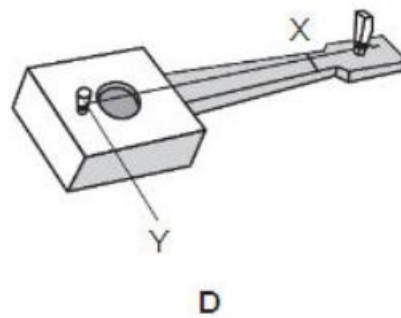
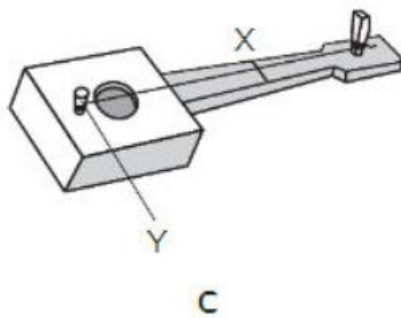
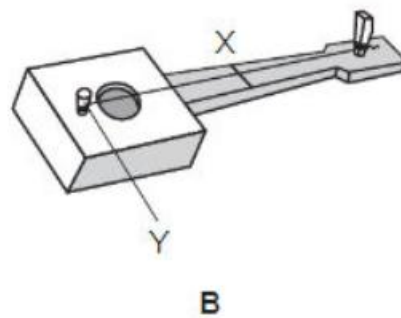
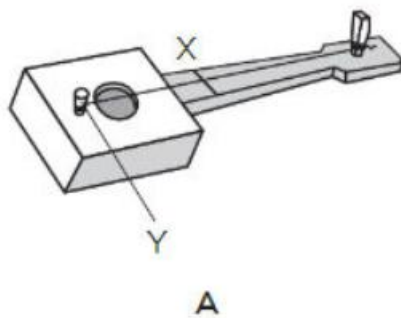
- 8 Name the control variables in their investigation.
Explain why they are control variables.

- 9 What is the independent variable in their investigation?
Explain why it is the independent variable.

- 10 What is the dependent variable in their investigation?
Explain why it is the dependent variable.

Practice

Arun has made a guitar. Look at pictures A, B, C and D of Arun's guitar. So far he has only put on one string. Suppose Arun presses on the string at point X and then plucks the string between X and Y.



- 2 What is pitch?

- 3 Will the pitch be highest when the string is plucked between X and Y in drawing A, B, C or D? Explain why.

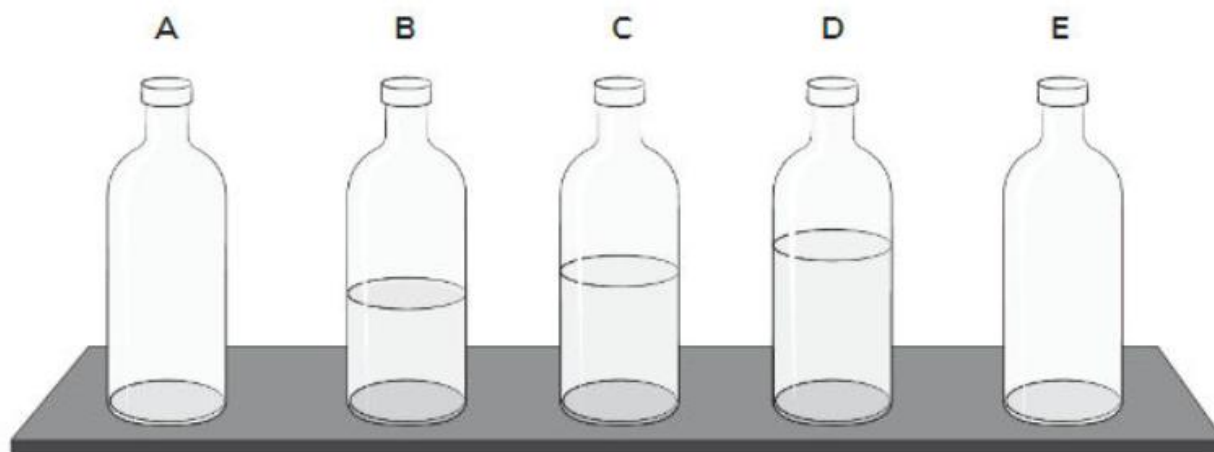
- 4 How will the pitch of the sound change if the guitar string is thicker?

Challenge

Zara made the musical instrument in the picture.

She filled some bottles with different amounts of water.

To play the instrument Zara blows across the tops of the bottles.



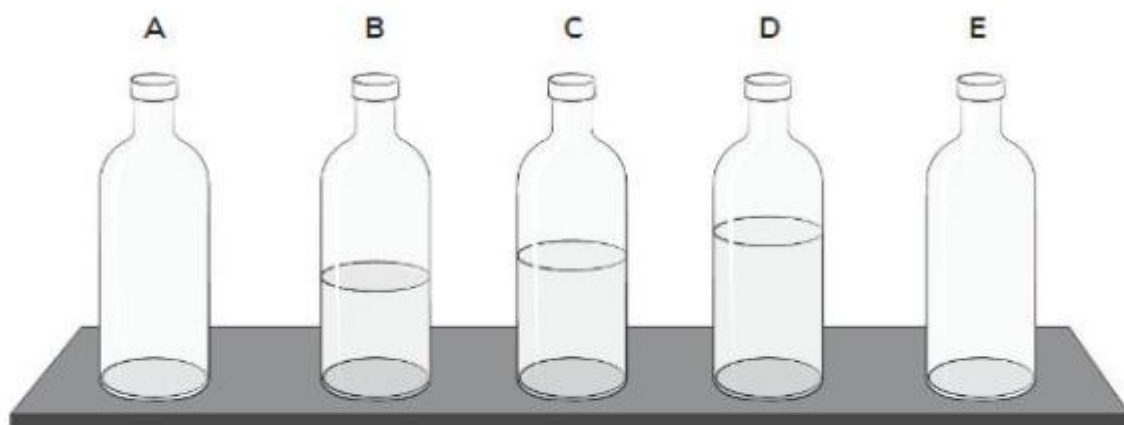
- 5 What type of musical instrument is this?

- 6 Which bottle, B, C or D, will produce the sound with the lowest pitch? Explain why.

- 7 Which bottle will produce the sound with the highest pitch? Explain why.

8 Zara wants to put water in the empty bottles A and E.

a Draw the level of water she must pour into bottle A to make a lower pitch than B.



b Draw the level of water she must pour into bottle E to make a higher pitch than D.

