

## Exercise 1

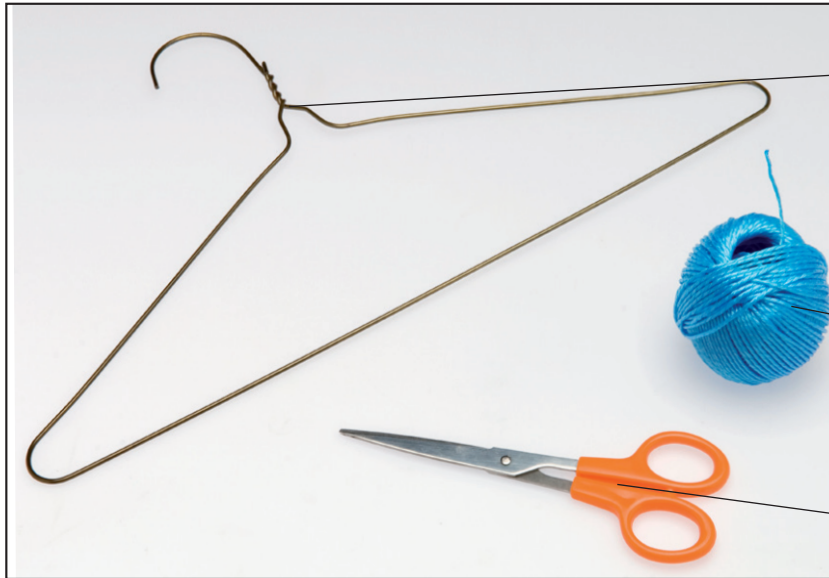
## Vocabulary: Materials

Label the diagram with the materials you used for this experiment.

metal object

ball of string

scissors



1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

## Exercise 2

## Vocabulary: Verbs

Complete the instructions for the experiment with the correct verbs from the box.

- 1 \_\_\_\_\_ a metal object and tie on one or two pieces of string.
- 2 \_\_\_\_\_ the other end of the string(s) around your finger(s).
- 3 \_\_\_\_\_ your finger(s) in your ears!
- 4 \_\_\_\_\_ forward so your object hangs down.
- 5 \_\_\_\_\_ the object against the table.
- 6 \_\_\_\_\_ to the sound ringing in your ears!

Put

Lean

Wrap

Knock

Choose

Listen

Look at your experiment sheet and check your answers.

## Exercise 3

## Conclusions: Speaking, Writing

**a) Put the steps in the right order to answer the question:**

How do we hear a sound when it is made?

- 1 Finally, you hear this vibration as sound.
- 2 In your ear the sound vibrates the eardrum.
- 3 Then the sound travels through the bones attached to your eardrum.
- 4 When a sound is made somewhere the sound waves travel to your ears.

**b) Match the descriptions with the explanations to answer the questions:**

What does it sound like before you put the string in your ears compared with after? Why? What would happen if you try to put the hanger directly against your ear? (Don't try with any sharp bits!)

<b>1</b> When you hit the metal object on the table without the string in your ears it sounds like a dull clank.	<b>A</b> This is because the vibrations travel through the metal, then along the string and through the bones of your fingers to your ears.
<b>2</b> When you hit the metal object on the table with it directly against your ear it has a sharper metallic sound.	<b>B</b> This is because some of the sound is lost as it travels through the air to your ears.
<b>3</b> When you hit the metal object with the string in your ears it sounds like a gong.	<b>C</b> This is because the metal object is connected to your ear and the sound has less distance to travel but no string to vibrate along.

## Exercise 4

## A Scientific Report: Writing

**Now write a report on your experiment. Use the language in the Useful Language box provided to help you.**

**Useful Language**

*useful language for writing a scientific report*

1. *Say what you made*

*We made ...*

**2. Say how you made it**

First we chose ...

Then we wrapped...

After that we put ...

Then we leaned ...

And then we listened ...

**3. Write your prediction here**

When we hit the metal object on the table without the string in our ears we thought the sound would be ...

When we hit the metal object on the table with the string in our ears we thought the sound would be ...

**4. Say what happened**

Without the string in your ears the sound was ...

With the string in your ears the sound was ...

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**Ear Gongs**  
Keith Kelly**Learning Objectives**

Pupils see how sounds travel much more effectively through materials such as metal and string than through air.

**Content summary**

When you hit the coat hanger the vibrations travel through the metal, then along the string and through the bones of your fingers to your ears. In your ear the sound vibrates the eardrum, then travels through the bones attached and you hear this vibration as sound. The dull clank you hear when the sound travels through the air (i.e. when you don't have the string in your ears) shows how much of the sound is lost on its journey to your ears.

**Skills**

Reading, speaking, writing

**Grammar**

Past simple; present simple

**Vocabulary**

Verbs: *choose, wrap, lean, hang, knock*

Adjectives: *metal*

Nouns: *gong, object, coat hanger, string*

**Time needed**

60–90 minutes

**Age group**

7–11

**Materials needed**

- 1 metal coat hanger, or other metal objects, e.g., cutlery
- Roll of string, or thread
- Scissors
- Hard surface

**Practicalities**

As we are asking students to put their string-wrapped fingers in their ears, it may be wise to warn them against pushing them too far in or sticking other objects into their ears.

## Procedure

1. Tell pupils they are going to conduct a scientific experiment and learn how they hear sounds, using an instrument called 'ear gongs'.
2. Introduce/pre-teach the vocabulary that pupils will need: *choose, wrap, lean, hang, knock, metal, gong, object, coat hanger, string*.
3. Hand out the experiment sheet and have pupils read out the instructions in class.
4. Ask them to work in groups and predict the results of the experiment following the questions which are on the worksheet. You may need to give them a little time to think and talk about this. They can do this first in their own language but should then try to express it in English. (They should use *will* e.g. *We think the sound will be ....*)
5. Pupils work in groups and follow the instructions on the experiment sheet. Monitor and help where required. Help pupils to say what they are doing in English.
6. Pupils try out their experiment. Get them to record their results. They can make notes in English or in their own language.
7. Ask students to discuss in their groups these questions: What does it sound like before you put the string in your ears compared with after? Why? Where is the sound coming from? How can we hear it? Why do we need the string? What would happen if you try to put the hanger directly against your ear? (Don't try with any sharp bits!)
8. Hand out the worksheet and ask pupils to work their way through exercises 1, 2 and 3. They can check their answers with a partner. These exercises consolidate the vocabulary used in the experiment and get them to come to a conclusion about how sounds travel and how we hear them.
9. Pupils then write up their findings in the form of a scientific report – encourage them to use the language in the Useful Language box. This exercise could be done for homework.

### Extra ideas to explore with your students

Try different types of string or thread.

Try with different objects made of metal and other materials.

What happens if every member of the group ties a piece of string onto the object? Does the sound get louder, softer or stay the same? Can everyone hear it?

What if your friend ties a thread onto one of your strings? Will he/she be able to hear the sound too? Can you still hear it? How has the vibration travelled? Bring in a triangle from the school's music room. When this is struck it makes a clear sound that we can hear through the air. Why do we need to hold it by the string?

What does it sound like if we hold the metal directly? How is that relevant to the coat hanger experiment?

**Ear Gongs**  
Keith Kelly

**Exercise 1 – Vocabulary: Materials**

- 1 – scissors
- 2 – a metal object
- 3 – a ball of string

**Exercise 2 – Vocabulary: Verbs**

Answers are on the experiment sheet

**Exercise 3 – Conclusions: Speaking, Writing**

- a) 4, 2, 3, 1
- b) 1B, 2C, 3A