

**Science – Year 3/4A Summer 2**

Sound

# **Sounds Spectacular**

Session 3

**Resource Pack**

Name:

I can record findings and use them to draw conclusions

### Which kind of ears hear best?

What we did

### Our Results

Test						
Type of ear						
						
						
						

Our results show

We think this is because

## Session 3 Teachers' Notes

### **A class investigation of hearing**

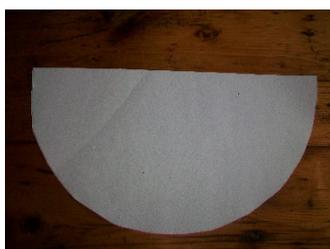
During this session the children will be encouraged to think of ears as sound detectors and to question why animal ears are the shape they are. They will be challenged to design their own fair test to compare hearing with:

- A bare ear
- A cupped hand behind an ear
- A cardboard animal ear

In science teaching it is often a good idea to allow groups of children to develop their own fair test to answer a scientific question as this gives scope for lots of different ideas and approaches as well as more opportunities for individual hands on involvement in the design and execution of the task. However, when children are investigating hearing, there is a necessity to control sounds and any background noise will ruin the results. For this reason a class investigation is the only feasible option.

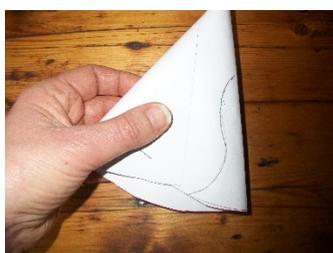
### **Making Simple Cardboard Animal Ears**

These ears are fun and very easy to make but you may well decide to prepare them yourself ahead of the session to save time. Alternatively, you could plan an animal ear making session with the children ahead of your science lesson where the children can make and decorate their own.



Cut out a semi-circle of card with a diameter of about 30cm (drawing round a large biscuit tin or storage tub lid is a quick way to do this)

Roll it up into a cone with a slightly open end so it that can be held up to the pinna (outer ear). Staple the overlapping card in a couple of places to hold it in place



Flatten the cone slightly and draw a loose s shape on one side.

Cut this section away to complete the cardboard ear



## A Workable Class Fair Test

During the lesson you will challenge the children to design their own class fair test to compare hearing. The best way to do this is to encourage discussion and guide their thinking through skilful questioning to ensure the test is practical and fair. Here are some suggestions that may be helpful.

- How can we compare hearing with the 3 different ears? With some sort of hearing test. Ask if anyone has ever had a hearing test. What happens? You listen to different sounds and indicate when you hear them. Are all the sounds easy to hear? No, some are very quiet.
- How can we make sounds for our hearing test? To make it fair we might need to repeat the same sound a few times. The sounds may need to be very quiet too. Ask for suggestions, e.g. tapping, whispering or dropping something. Which of these could be repeated to make exactly the same sound? Perhaps dropping something from the same height.
- Encourage some experimentation with repeated sounds. Discuss the results. If you drop something, e.g. a paperclip, onto a desk it makes a loud sound that everyone can hear easily. How can you vary it to make it harder to hear? Try dropping onto a different surface, e.g. a carpet.
- Some children may suggest dropping it from further away. Try this. What happens? Perhaps ask a child to make the quiet sound from varying distances away. What do you notice? Others may suggest dropping it from a lower height. Try this out. What happens? Can children explain the reasons for this in terms of the strength of the vibrations? Vibrations spread out from the sound like ripples on a pond when you throw a pebble in. As the ripples spread out they get smaller - sound is like this too - the sound energy is spreading itself out and getting weaker as the distance grows. Similarly, dropping from a height causes stronger vibrations than a low drop.
- Settle on a very quiet but just audible sound (when heard quite close) that can be repeated.
- Encourage discussion on how the 3 different “ears” can be tested. For each idea discuss whether the test is fair. One method would be to test all together making a circle so that everyone is the same distance from the sound - one third with a bare ear, one third with cupped hand and one third with a cardboard ear. It is important that the listening ear is facing the sound to gather the vibrations. The class may come up with an alternative fair test.
- What if some people just have better hearing than others? Perhaps you could do the test 3 times and everyone swap ear type each time.
- What if everyone can hear it? Try a method to make it harder to hear. Children may suggest progressively spreading out the circle to make the distance greater or dropping from a progressively lower height.
- Think about where to carry out the test - ideally a quiet space would be best.
- How will each person indicate whether they have heard the sound? Perhaps raising a hand when they hear it.
- Will the listeners need to close their eyes? Why might this be important?
- Who will record the results? How will they do it? Discuss how to draw a table on the flip chart - label rows and columns ready.

Your class may come up with their own ideas for a fair test.

**Health and Safety**

It is important to warn children that their ears are delicate and they should never insert anything into the ear canal. The cardboard ears should only be placed up close to the ear canal and not into it.

**Hearing Impaired Pupils**

Children with reduced hearing could still take part in the fair test if they want to or alternatively they could be chosen to make the sound, or to be a counter (of those who hear the sounds in each group) or a recorder of results on the chart.