

.....

# TeaCHERS



resource  
pack



### **Page 1      HOW DOES THE EAR WORK?**

Describes the anatomy of the ear and explains how the ear functions. This page can be used in conjunction with page 2, which illustrates the anatomy of the ear, to allow the children to identify the parts of the ear as they learn how we hear sounds.

### **Page 2 + 3      THE ANATOMY OF THE HUMAN EAR**

Allow the children to study the diagram of the ear on page 2 for a short time, and then ask them to name the parts of the ear on page 3.

### **Page 4      WORD MAZE**

The task is to find the words or phrases relating to the ear which are hidden in the word maze. This gives them children a chance to play with the new words introduced to them.

### **Page 5      WHAT CAUSES HEARING LOSS?**

The first section is designed to help children understand that wearing a hearing aid is similar to wearing glasses or a brace, which they may be more familiar with. The second half of the page explains that there are a number of reasons why people lose their hearing, and ways in which they can help to prevent damage to their hearing.

### **Page 6      HOW DOES A HEARING AID WORK?**

Page 6 describes the three basic units which are required for a hearing aid with a simplified diagram and explanation. It then goes on to illustrate *how* sounds are amplified, and asks the children to think of other items at home which perform the same function as a hearing aid eg. a stereo.

### **Page 7      DESIGN A HEARING AID FOR....**

This allows the children to be creative based on the knowledge they have gained throughout the pack. The task is to design a hearing aid for a specific animal chosen from the list, taking into consideration their habitat, feeding habits, size, shape, colour, etc. and how the aid would attach onto the animals' ears.

Answers should include an explanation and drawings of their final designs.

### **Page 8      DID YOU KNOW? 4 FACTS ABOUT ANIMAL'S HEARING**

Some fun facts about animals and how they "hear".



# How does the ear work?



The ear is made up of **three** sections

- the **outer ear**
- the **middle ear**
- the **inner ear**

The **outer ear** is made up of the **pinna** and the **ear canal**. The entrance of the ear canal is lined with **hairs** and **wax**, which help to keep it **clean**. **Wax** is a sign of a **healthy functioning ear**.

The **ear canal** leads to a **flexible, circular membrane**, called the **eardrum**. The **sound waves** pass down the **ear canal**, causing the **ear drum** to **vibrate**. These vibrations then pass into the **middle ear**.

- The **middle ear** contains **three** tiny bones, namely the
- **Hammer, Anvil** and **Stirrup**.
- These bones **increase** and **strengthen** the vibrations and
- pass them onto the **inner ear**.

To summarise, **vibrations** from the **air (sounds)** are **collected** by the ear and changed into **nerve impulses**, which the **brain 'translates'**.

It is not yet clearly understood how the electrical signals are interpreted by the brain.

The **inner ear** contains a system of tubes, which are filled with a **watery liquid**. This is called the **cochlea**. As **sound waves** pass from the **middle ear** through the **oval window** into the **inner ear**, this liquid moves and **sensitive nerve endings** change this movement into **electrical signals**. These **electrical signals** are sent to the **brain** along the **nerve of hearing**, known as the **auditory nerve**.

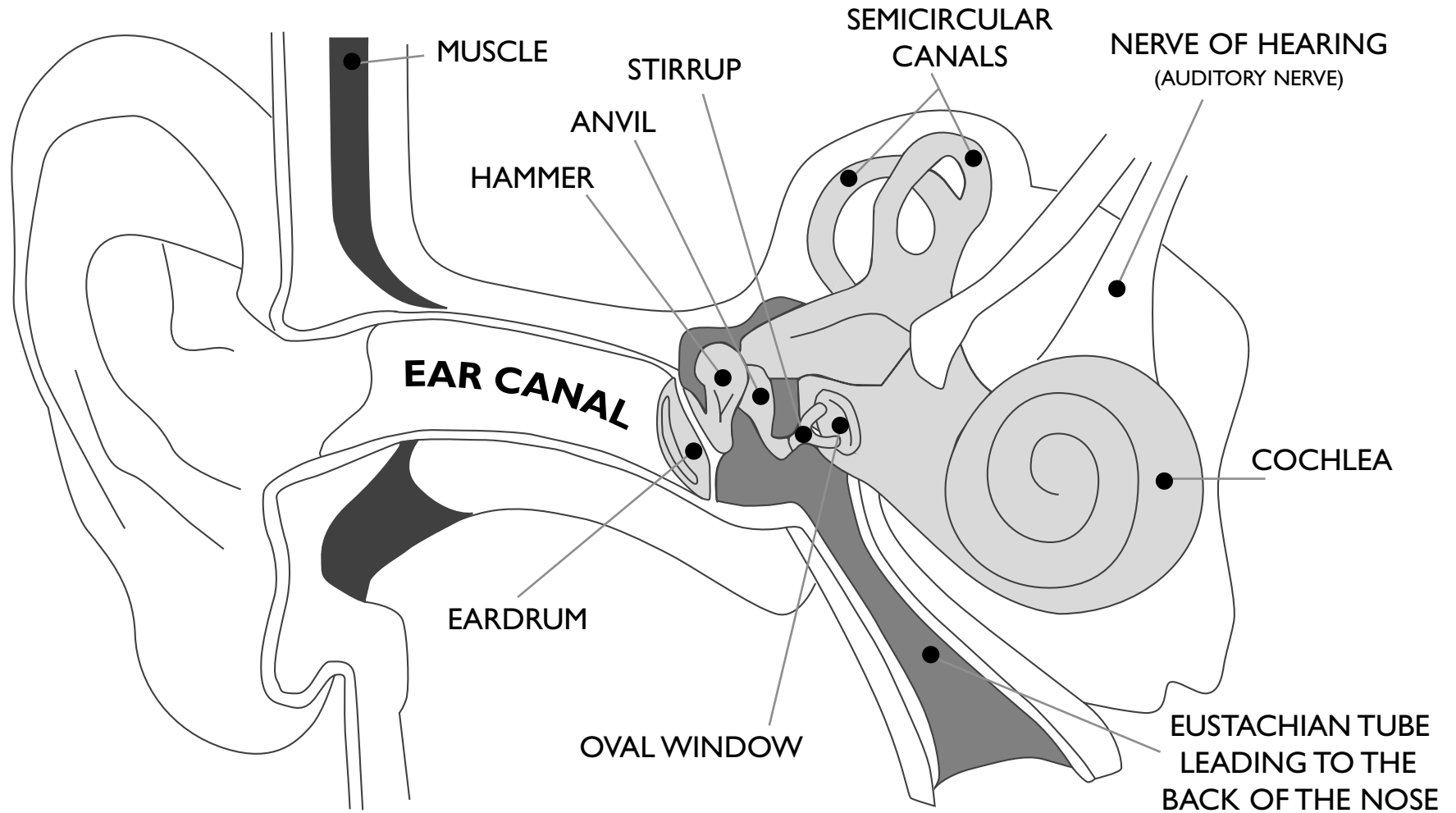
# The anatomy of the human ear



OUTER EAR

MIDDLE EAR

INNER EAR

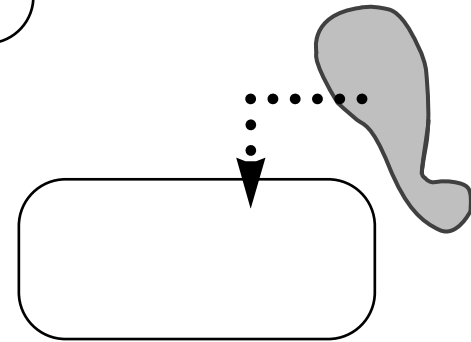
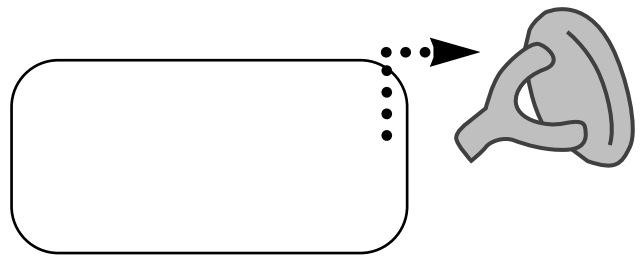
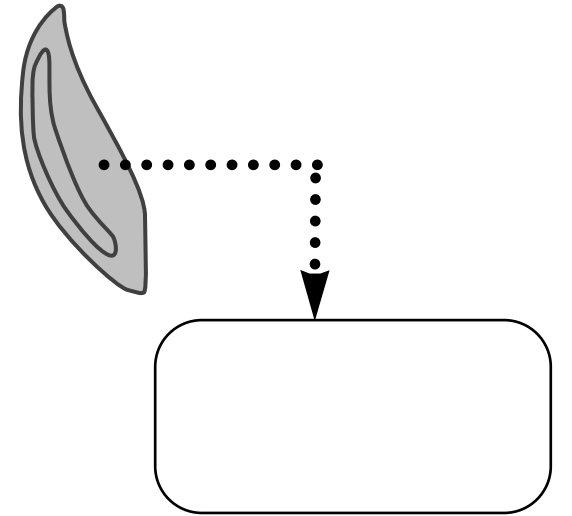
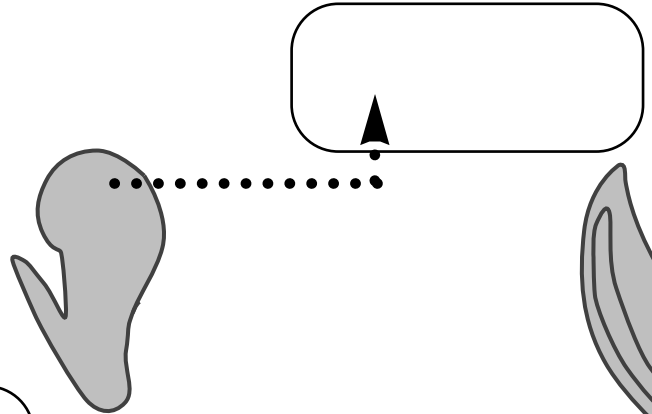
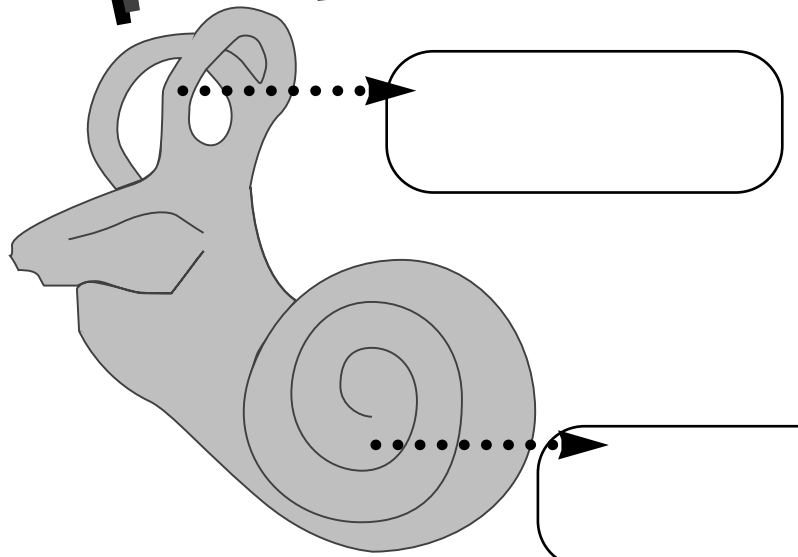




Can you name the parts of the ear illustrated below?

# Task:

Study the diagram on page 2 and then name the parts of the ear shown below. Put your answers in the boxes next to each diagram.





Task:

Find the following words or phrases that are hidden either vertically or horizontally in the word maze:

- CANAL
- COCHLEA
- INNER EAR
- MIDDLE EAR
- OVAL WINDOW
- OUTER EAR
- PINNA

B	O	C	D	S	A	D	I	H	O
C	A	N	A	L	W	E	N	G	V
O	F	R	E	G	R	Y	N	F	A
C	S	T	E	V	A	N	E	B	L
H	P	I	N	N	A	I	R	K	W
L	D	J	D	S	C	B	E	A	I
E	F	T	M	A	O	I	A	H	N
A	S	K	P	T	L	O	R	F	D
M	I	D	D	L	E	E	A	R	O
O	U	T	E	R	E	A	R	I	W

Some people wear \_\_\_\_\_  
to help straighten their teeth .....



.....some wear \_\_\_\_\_ to  
help them to see better.....



.....and some people wear a \_\_\_\_\_  
\_\_\_\_\_ to help them to hear.



# What causes hearing loss?



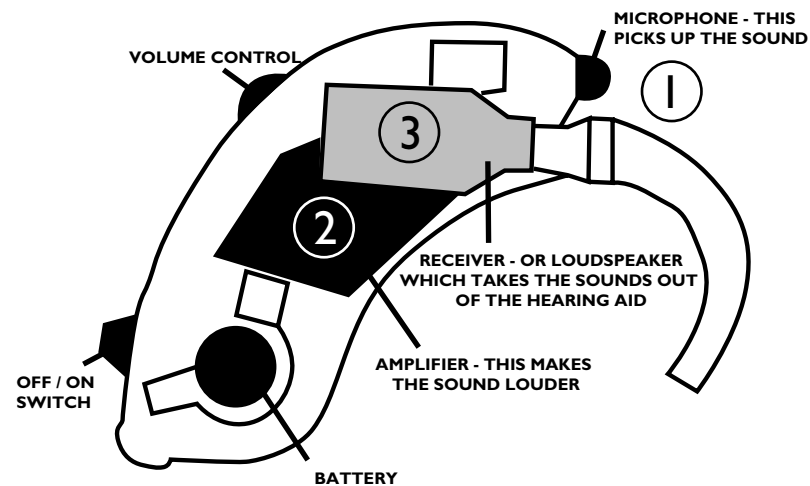
- **Some people are born with a hearing problem.**
- **Some diseases or infections, such as measles or mumps, can cause hearing problems. Even colds or flu can affect your hearing, although it may not last.**
- **Many people, as they get older, find that their hearing is not as good as it used to be.**
- **Noise can damage your ears - never have your personal stereo, television or radio turned up too loud.**
- **Hearing loss may run in the family - maybe a parent or grandparent has a hearing problem which has been passed down through the generations.**

**Task: 5**  
Fill in the spaces to  
complete the sentence.

# How does a hearing aid work?

A hearing aid is built from three basic units:

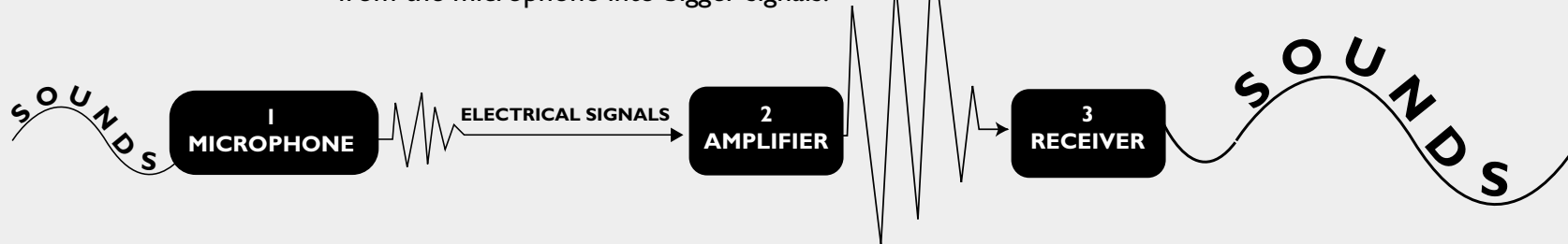
- 1 MICROPHONE
- 2 ELECTRONIC AMPLIFIER
- 3 RECEIVER



The microphone changes sounds into electrical signals.

These electrical signals are then amplified by the amplifier. The amplifier's function is to increase the electrical signals from the microphone into bigger signals.

The receiver, or loudspeaker, transforms the amplified electrical signals into sounds.



## Task:

Look closely at the diagram of the hearing aid above which highlights its basic functions. Can you think of some items in your home which have a similar function? Write your answers down opposite.

---

---





# Design a hearing aid for ....

# 7



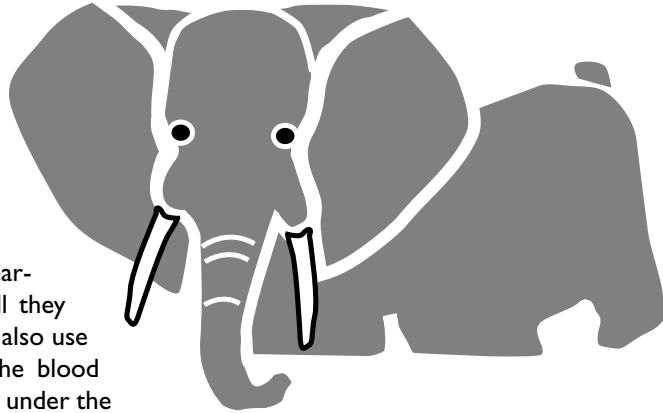
**Task:** Find a partner and choose one of the animals from below. The task is to design a hearing aid for your animal in order to help it carry out everyday tasks, for example in finding food. Diagrams and an explanation of how you came about your final design should be included in your answer. Think about the size of its ears, how the aid would look (eg. shape and colour?). You might want to take another look at the three basic units that make up a hearing aid (page 6) for some help.



**ELEPHANT RABBIT LION MONKEY HORSE**  
**PIG DOG GIRAFFE CAT MOUSE**



## WHY ARE ELEPHANTS EARS LARGE



Elephants have very good hearing, but that is not all they use their ears for - they also use their ears for cooling. The blood vessels in their ears lie just under the surface of the skin, and when the elephant flaps its ears, the blood loses heat, cooling down the elephants body. Elephants ears also make great fans to fan cool air over themselves!

## HOW DO CATS TURN THEIR EARS?



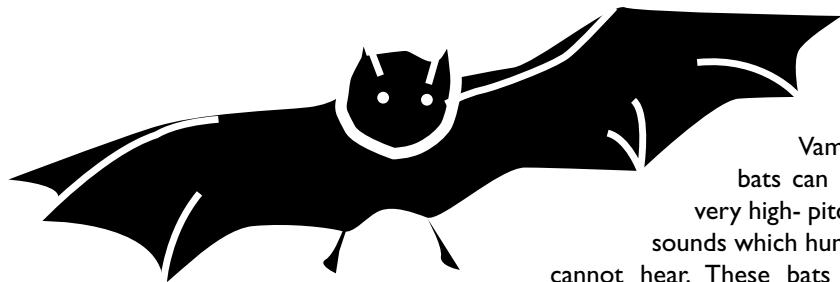
Cats also have excellent hearing. When we look at our own ears, we have only 6 muscles, whereas cats have 30 muscles in their ears. This allows cats to turn their ears very quickly and accurately to determine where a sound is coming from. A cat can turn its ears far more quickly than a dog can.

# 8

## DID YOU KNOW ?

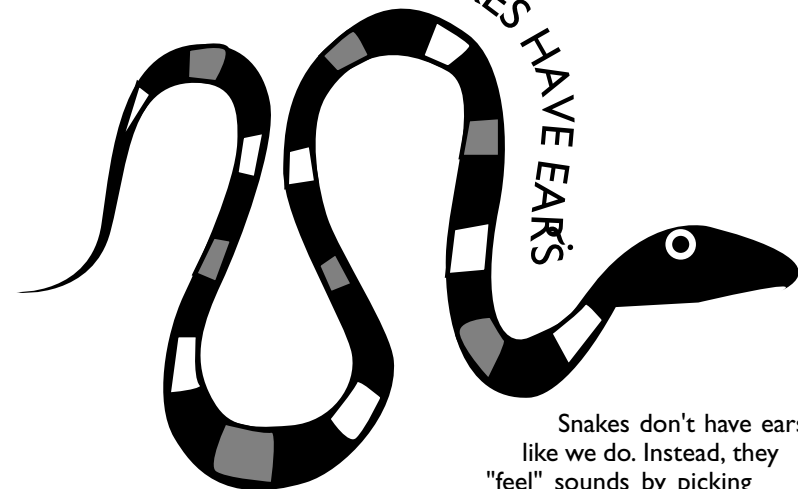
### FACTS ABOUT ANIMALS' HEARING

## HAS VAMPIRE BAT GOT GOOD HEARING?



Vampire bats can hear very high-pitched sounds which humans cannot hear. These bats can hear sounds up to 150,000 cycles per second, which is more than seven times as high as the highest sounds people can hear. As a bat flies, it constantly sends out very high-pitched sounds. The sound waves bounce off objects and echo back towards the bat. The bat's large, pointed ears are like sound funnels. They collect the sounds and send messages to the bat's brain.

## DO SNAKES HAVE EARS?



Snakes don't have ears like we do. Instead, they "feel" sounds by picking up vibrations in the ground.



Now that you have completed the pack, your final task is to colour Oscar in

# The TeaCHERs Resource Pack

*is just one of a number of items available in the Otikids Range from Oticon. Otikids is a service programme for children, parents, hearing care professionals & teachers. The primary function of Otikids is to promote the interests of hearing impaired children, through information and support, using practical tools and material which have particular appeal for children of all ages.*

**For more information on the Otikids Range please contact:**



**OTICON**

Advanced Hearing Center  
130 Tarrytown Road  
Manchester, NH 03103  
603-669-0831