1.1.2

The ear – 30 000 receptors help you hear

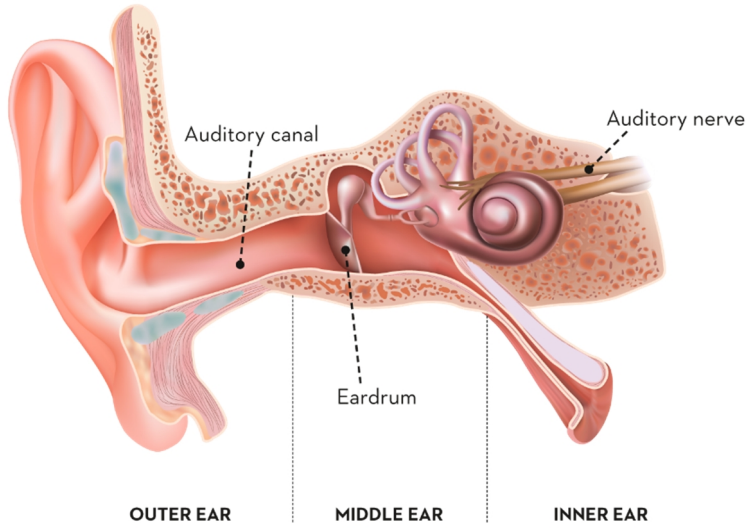
EXTERNAL SOUNDS AND SOUNDS INSIDE YOUR MOUTH

Like sight, hearing is a reaction to physical stimuli.

For ears, these stimuli are sound waves.

We can distinguish between 2 types of sound. 'External' sounds, for example the sound of cooking, and sounds 'inside your mouth', which are caused by chewing. These 2 types of sound are not perceived by the same parts of the ear.

OUTER, MIDDLE AND INNER EAR



The ear has 3 parts: the outer ear, middle ear and inner ear.

It comes as no surprise that external sounds are perceived by the outer ear. These sounds are then amplified in the middle ear.

As you chew food, it disintegrates causing sound vibrations. As the middle ear is connected to the back of your mouth, your jawbones transmit these vibrations to the middle ear.

Whether for external sounds or sounds produced inside the mouth, the inner ear turns these sound waves into electric impulses. The auditory nerve transmits these impulses to the brain, which turns them into perceptions of sound.

HEARING AND OUR EXPECTATIONS

The appearance of food can make us expect a certain sound in our mouths. For example, you expect to hear an apple crunch or a raw carrot make a snapping sound. You would also expect a biscuit to sound crunchy or a sparkling drink to fizz.

However, when you eat something, your hearing plays a more minor role than the other senses.

1.1.2

The ear – 30 000 receptors help you hear

Hearing reacts to chemical stimuli.

- O True
- O False

How many parts are there in a human ear?

- O 1
- O 2
- O 3

The inner ear converts external noises and mouth sounds into...

- O emulsions
- O electrical impulses
- O chemical impulses

When we eat, hearing plays a more important role than the other senses.

- O False
- O True

Starting with the auricle of the ear and moving inwards, can you put the three parts of the ear in the correct order?

- O The middle ear, the inner ear and then the outer ear
- O The outer ear, the middle ear and then the inner ear
- O The inner ear, the middle ear and then the outer ear

External noises and the sounds produced inside the mouth are picked up by the same part of the ear, i.e. the outer ear.

- O True
- O False

The physical properties of food do not create any expectations of the sound it will make in your mouth.

- O False
- O True

Which part of the ear amplifies external noises?

- O The outer ear
- O The middle ear
- O The inner ear

Which nerve transmits electrical impulses from sound stimuli to the brain?

- O The optic nerve
- O The trigeminal nerve
- O The auditory nerve

Answers

Hearing reacts to chemical stimuli.

- ○ **True**
  Wrong! Hearing reacts to the same types of stimuli as sight does.
- ● **False**
  Well done! Just like sight, hearing responds to physical stimuli. With hearing though, the stimuli are sound waves.

How many parts are there in a human ear?

- ○ **1**
  Wrong! There are more than that. Try again!
- ○ **2**
  Wrong! There are more than that. Try again!
- ● **3**
  Correct! There are three parts: the outer ear, the middle ear and the inner ear.

The inner ear converts external noises and mouth sounds into...

- ○ **emulsions**
  Wrong! Sensory stimuli are all carried through your body in the same way.
- ● **electrical impulses**
  Correct! These sounds are converted into electrical impulses that are transmitted to your brain.
- ○ **chemical impulses**
  Wrong! Try again, you're on the right track.

When we eat, hearing plays a more important role than the other senses.

- ● **False**
  Well done! When we eat, hearing only plays a limited role compared to our other senses.
- ○ **True**
  Wrong! Imagine you are eating an apple. Is hearing really more important than your other senses?

Starting with the auricle of the ear and moving inwards, can you put the three parts of the ear in the correct order?

- ○ **The middle ear, the inner ear and then the outer ear**
  Wrong! Try again and think logically.
- ● **The outer ear, the middle ear and then the inner ear**
  Well done! That's right, the three parts of your ears follow a logical order.
- ○ **The inner ear, the middle ear and then the outer ear**
  Wrong! Try again and think logically.

External noises and the sounds produced inside the mouth are picked up by the same part of the ear, i.e. the outer ear.

- ○ **True**
  Wrong! External noises are picked up by your outer ears and sounds inside your mouth by your middle ears, which are connected to the back of your mouth.
- ● **False**
  Well done! External noises are picked up by your outer ears and sounds inside your mouth by your middle ears, which are connected to the back of your mouth.

The physical properties of food do not create any expectations of the sound it will make in your mouth.

- ● **False**
  Well done! The physical properties of food can be linked to the sound it will produce in your mouth. For example, we expect a biscuit to make a crunchy sound.
- ○ **True**
  Wrong! Picture a biscuit. Can you imagine the sound it will make in your mouth?

Which part of the ear amplifies external noises?

- ○ **The outer ear**
  Wrong! Your outer ears pick up external noises.
- ● **The middle ear**
  Well done! It is in fact your middle ears that amplify the noises they receive from your outer ears.
- ○ **The inner ear**
  Wrong! Your inner ears convert sound waves into electrical impulses.

Which nerve transmits electrical impulses from sound stimuli to the brain?

- ○ **The optic nerve**
  Wrong! Your optic nerves transmit visual stimuli.
- ○ **The trigeminal nerve**
  Wrong! Your trigeminal nerves transmit sensations such as spicy, burning, refreshing, astringent, etc.
- ● **The auditory nerve**
  Well done! Your auditory nerves transmit electrical impulses from sound stimuli to your brain.

ACTT01C01L02_C

What do you hear? What am I?

[8-10 years old and 11-13 years old and 14-16 years old]

Guess the food from the following sounds.
Choices **: popcorn, an apple, chewing gum, a biscuit, cereal**

1. http://freesound.org/data/previews/401/401669_7738409-lq.mp3
2. http://freesound.org/data/previews/249/249320_4451798-lq.mp3
3. http://freesound.org/data/previews/272/272420_5163890-lq.mp3
4. http://freesound.org/data/previews/72/72732_959512-lq.mp3
5. http://freesound.org/data/previews/65/365705_6038583-lq.mp3

It is not easy to recognise food from the sound it makes. When you eat something, your sense of hearing plays a limited role compared to your other senses.

Answer

What do you hear? What am I?

[8-10 years old and 11-13 years old and 14-16 years old]

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5. http://freesound.org/data/previews/65/365705_6038583-lq.mp3

Answer: 1. a biscuit, 2. an apple, 3. chewing gum, 4. cereal, 5. popcorn

It is not easy to recognise food from the sound it makes. When you eat something, your sense of hearing plays a limited role compared to your other senses.