

## The ear – 30 000 receptors help you hear

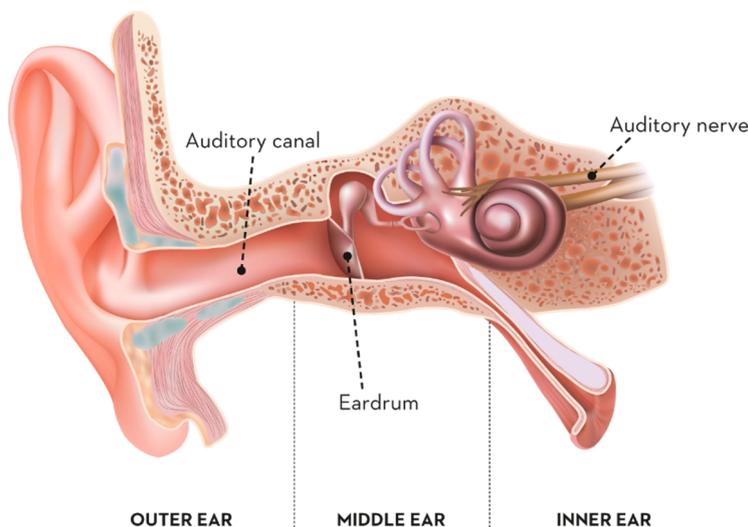
### EXTERNAL SOUNDS AND SOUNDS INSIDE YOUR MOUTH

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.

## The ear – 30 000 receptors help you hear

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The ear perceives sounds inside the mouth as well as external noises.

- True
- False

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Hearing reacts to chemical stimuli.

- True
- False

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How many parts are there in a human ear?

- 1
- 2
- 3

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

- False
- True

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

- False
- True

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

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

## Answers

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The ear perceives sounds inside the mouth as well as external noises.

**True**

*Well done! Your ears provide you with information about sounds in your mouth, such as when food crunches or a drink fizzes, and about external noises, for example of meat crackling as it is grilled.*

**False**

*Wrong! Think of when you cut an apple and when you bite into it.*

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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.*

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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.*

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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?*

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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?*

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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.*

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## What do you hear? What am I?

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

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## What do you hear? What am I?

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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.