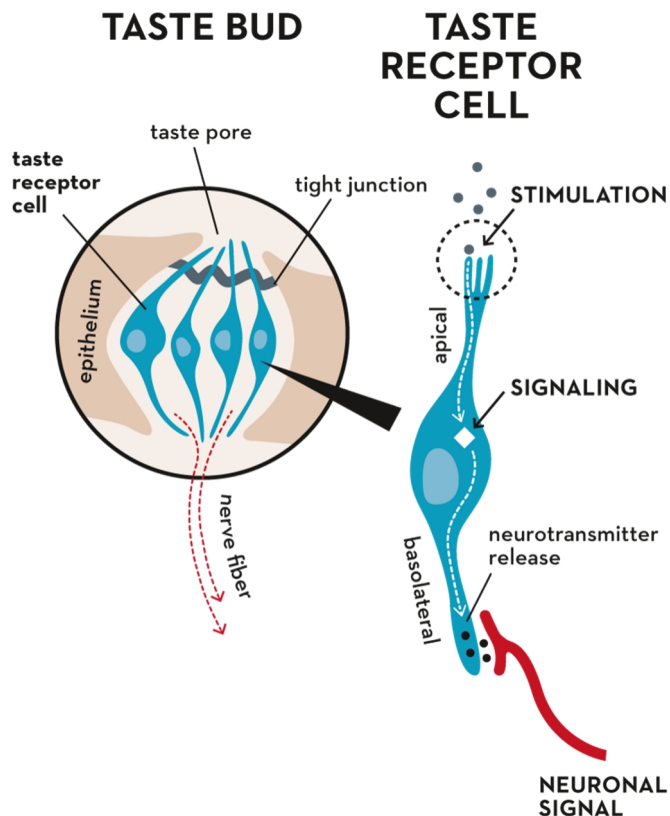


## Taste buds

### TASTE BUDS

Taste happens in your mouth, mainly on your tongue. Everything you eat comes through this 'entrance'. Your tongue allows you to recognise and enjoy the taste of food. It is home to several thousand taste buds.



These papillae contain the **taste buds**, which in turn contain the **taste receptors**. The molecules that create taste, known as the 'sapid molecules', are dissolved in saliva and enter into contact with the taste receptors.

On the opposite side, at their base, are the taste buds which are in contact with the taste nerves sending signals to the brain.

### THE IMPORTANCE OF TASTE

Throughout evolution, our sense of taste has not only allowed us to enjoy the substances we need to eat to live, but also to detect toxic substances. Many toxic substances have a bitter taste – such as cyanide or arsenic, which are both deadly.

Like olfactory perceptions, the sense of taste varies greatly from one person to another. In particular it depends on your own personal experiences. Like other sensory cells, taste buds die and are replaced.

They only survive for 10 days, which explains why, when you burn your tongue and kill off a certain number of cells, things return to normal fairly quickly.

## 1.2.3 Taste buds

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Where are taste receptors found?

- On flower buds
- On taste buds
- In the stomach

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How long is the average lifespan of a taste bud?

- 10 months
- They last as long as we live
- 10 days

---

How many basic tastes can the tongue perceive?

- None
- 4
- 5

---

Which of these words does not correspond to a basic taste?

- Umami
- Salty
- Peppery

---

The tongue receives stimuli which are then transmitted by...

- the trigeminal nerve
- the olfactory nerve
- the gustatory nerve

---

Each of the 5 basic tastes is perceived on a specific area of the tongue.

- False
- True

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When did the Japanese scientist Kikunae Ikeda propose the fifth basic taste?

- In 1980
- 1908
- 1890

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What does umami mean in Japanese?

- Frothy
- Creamy
- Tasty

---

Trigeminal sensations correspond to perceptions which are...

- sweet and salty
- bitter and sour
- spicy and burning

---

Your tongue perceives the strawberry flavour of ice cream.

- True
- False

## Answers

### Where are taste receptors found?

- On flower buds**  
*Wrong! Try again!*
- On taste buds**  
*Well done! Taste receptors are located in your taste buds in your lingual papillae.*
- In the stomach**  
*Wrong! Your stomach is further along your digestive system and plays no role in perceiving taste.*

### How long is the average lifespan of a taste bud?

- 10 months**  
*Wrong! It is shorter than that.*
- They last as long as we live**  
*Wrong! Your taste buds are renewed frequently throughout your life.*
- 10 days**  
*Well done! Taste buds are renewed frequently. You'll realise this if ever you burn your tongue.*

### How many basic tastes can the tongue perceive?

- None**  
*Wrong! Your tongue does perceive tastes.*
- 4**  
*Wrong! Until 1980, only four basic tastes were recognised. Since then, scientific knowledge has identified at least another one.*
- 5**  
*Well done! In 1980, after much consideration, the scientific community accepted umami as the fifth basic taste.*

### Which of these words does not correspond to a basic taste?

- Umami**  
*Wrong! Umami was acknowledged as one of the basic tastes in 1980.*
- Salty**  
*Wrong! Salty is actually one of the five basic tastes.*
- Peppery**  
*Well done! Peppery is not a taste. Pepper triggers olfactory sensations and spicy sensations, known as trigeminal sensations. If we eat overly peppered food, these sensations sometimes make us want to sneeze.*

### The tongue receives stimuli which are then transmitted by...

- the trigeminal nerve**  
*Wrong! Your trigeminal nerves transmit trigeminal sensations perceived by your facial mucous membrane.*
- the olfactory nerve**  
*Wrong! Your olfactory nerves transmit odours and aromas.*
- the gustatory nerve**  
*Well done! Your gustatory nerves transmit taste stimuli perceived by your tongue.*

### Each of the 5 basic tastes is perceived on a specific area of the tongue.

- False**  
*Well done! Today, we use the term continuum, to show that all areas of your tongue perceive basic tastes to varying degrees of intensity.*
- True**  
*Wrong! Even though this theory was thought to be true for a very long time, we now know that it is not.*

### When did the Japanese scientist Kikunae Ikeda propose the fifth basic taste?

- In 1980**  
*Wrong! That is when the scientific community recognised umami as a basic taste.*
- 1908**  
*Well done! Sodium glutamate was isolated and proposed as the fifth taste in 1908.*
- 1890**  
*Wrong! It was later than that.*

### What does umami mean in Japanese?

- Frothy**  
*Wrong! It is the taste given by sodium glutamate, in particular. This ingredient can be found in a wide range of delicious Japanese dishes.*
- Creamy**  
*Wrong! It is the taste given by sodium glutamate, in particular. This ingredient can be found in a wide range of delicious Japanese dishes.*
- Tasty**  
*Well done! It is the name that denotes the taste of sodium glutamate found in a wide range of Japanese dishes.*

### Trigeminal sensations correspond to perceptions which are...

- sweet and salty**  
*Wrong! These are tastes, perceived by your tongue.*
- bitter and sour**  
*Wrong! These are tastes, perceived by your tongue.*
- spicy and burning**  
*Well done! These are diffuse sensations relayed by your trigeminal nerves to the mucous membranes in your face, mouth and nose.*

### Your tongue perceives the strawberry flavour of ice cream.

- True**  
*Wrong! Flavour is actually a combination of perceptions (aromas, tastes and trigeminal sensations).*
- False**  
*Well done! Your tongue perceives the sweet taste of strawberry ice cream while your retronasal pathway perceives the strawberry aroma. Together, this combination produces the strawberry flavour, not just the taste.*

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## Tastes

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*[8-10 years old and 11-13 years old]*

Group the following food according to its main taste (sweet, sour, salty, bitter): pineapples, clementines, coffee, walnuts, salt, sugar, bananas, grapefruit, vinegar, jam, cauliflower, gherkins, cocoa, ham, cheese, chicory, lemons, pears, crisps, honey.

Sweet :	
Salty :	
Sour :	
Bitter :	

## Answer

### Tastes

*[8-10 years old and 11-13 years old]*

Group the following food according to its main taste (sweet, sour, salty, bitter): pineapples, clementines, coffee, walnuts, salt, sugar, bananas, grapefruit, vinegar, jam, cauliflower, gherkins, cocoa, ham, cheese, chicory, lemons, pears, crisps, honey.

Sweet :	sugar, honey, jam, pears, pineapples, bananas
Salty :	ham, cheese, crisps, salt
Sour :	gherkins, clementines, lemons, vinegar, grapefruit
Bitter :	chicory, cocoa, walnuts, cauliflower, coffee

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## Numbing taste buds

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[8-10 years old and 11-13 years *old*]

Instructions:

Keep an ice cube in your mouth for a minute.

Remove the ice cube and immediately put a piece of fruit in your mouth.

Can you taste the fruit?

Wait two minutes then taste the fruit again.

Can you taste the fruit better?

Explanation:

The cold ice cube numbs your taste buds and inhibits any sensation. Hence it is difficult to taste the first piece of fruit. When your taste buds warm up, they can tell you about its taste again. So, the temperature of food and of your mouth can influence the intensity of your perception of tastes. This is also the reason why cold food may taste less sweet than hot food, even when they contain the same amount of sugar.

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## Dry taste buds

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

### Instructions:

Dry your tongue with a piece of kitchen paper.

Place a sugar cube on your tongue, keeping your mouth open. Then remove the sugar cube.

Can you detect a sweet taste on your tongue?

Close your mouth so that your tongue gets covered in saliva again.

Place the sugar cube on your tongue and close your mouth.

Is it easier to taste the sugar now?

### Explanation:

Saliva is vital for tasting food. When you wipe away your saliva on kitchen paper, you realise just how important saliva is for tasting food. Saliva dissolves molecules, allowing them to penetrate the pores of your taste buds. Without saliva, the molecules do not bind to your taste receptors so they cannot convey information to your brain.

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## The role of sight in perceiving flavours

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

### Instructions:

Select four flavours of yoghurt (e.g. banana, vanilla, strawberry, cherry).  
Write down the flavour of each yoghurt on a label.  
Pour each yoghurt into a glass and place it beside its corresponding label.  
Then turn the labels over.

Ask someone to taste the yoghurts and guess the flavours.  
Is it easy to identify the flavours?

Repeat the experiment by pouring natural yoghurt into four glasses and adding the flavouring of your choice (colourless essences if possible).

Is it easier or harder to identify the flavours?

### Explanation:

Like your sense of smell, your sense of sight helps you recognise flavours. It is therefore harder to recognise vanilla yoghurt when it is white than when it is yellow. It would be even harder to recognise vanilla yoghurt if you had added pink colouring!