

Eating with your eyes

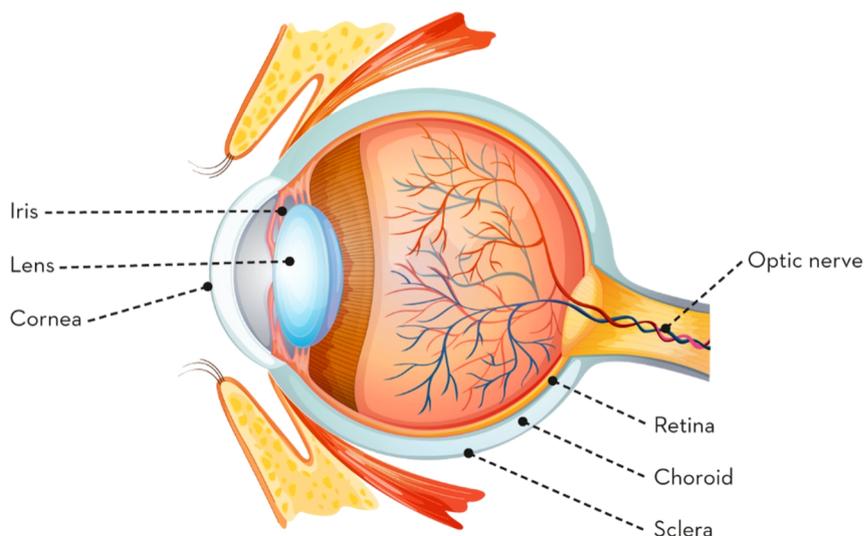
PHYSICAL AND CHEMICAL STIMULI

Our five senses enable us to receive information about the outside world. Some of these senses react to 'physical' stimuli and others to 'chemical' stimuli.

Take our eyes, for example. What type of stimulus do you think they respond to? Physical or chemical? With **sight**, there is a reaction to **physical stimuli**. This is also the case with hearing and touch.

Smell and **taste**, however, are responses to **chemical stimuli**.

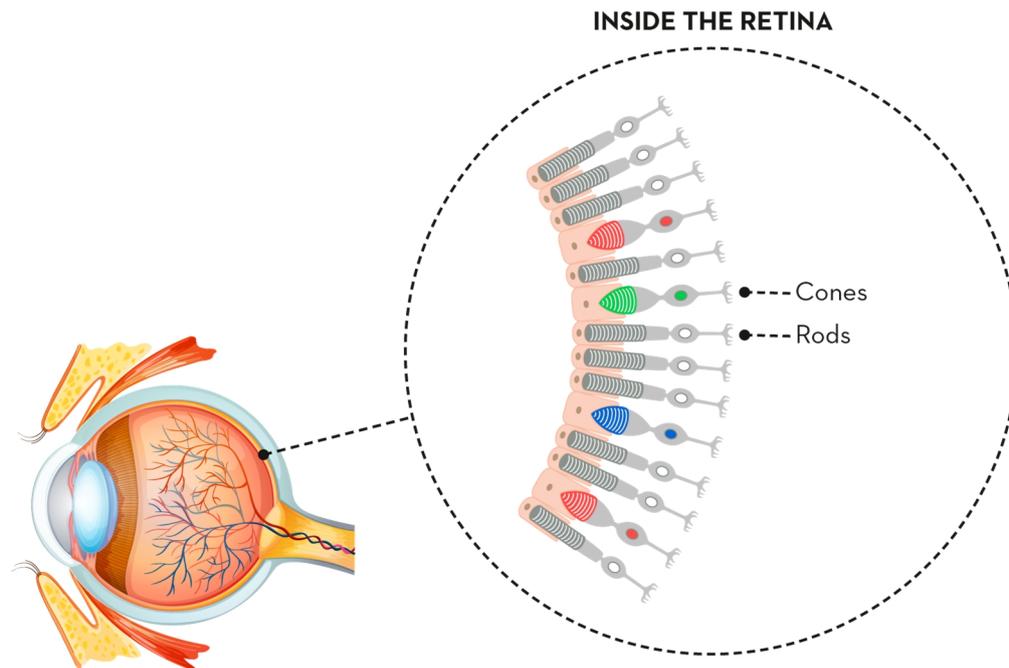
We would often find it hard to identify food without the sense of sight.



Sight generally provides us with a first impression of the food we eat.

RECEPTORS

Our eyes are made up of over 100 million receptors. 5% of these receptors are represented by what are called the retinal **cones**.



Most of these cones are located in the centre of the retina. They tell us about the colour and sharpness of objects.

The other 95% are represented by the retinal **rods**. Most of these rods are concentrated around the edge of the retina. They are 1000 times more sensitive to light than the cones and enable us to see things in dim light. However, they cannot distinguish between colours.

VISUAL INFORMATION

Eyes are able to send visual information to the brain at high speed. They send information to the brain in a few milliseconds via the **optic nerve**.

Our eyes provide us with information about the **shape** of food. Is it round like an orange or a melon, or oval like a lemon or a potato?

We also see the **colour** of food. For example, beans and spinach are green, whereas strawberries and cherries are red.

Then there is the **state** of food. In other words, if it is liquid, like water or fruit juice, or solid like a biscuit or a hazelnut.

Our eyes also enable us to register the **size** of food. Is it more like the size of a pea or the size of a watermelon?

Finally, there is the **texture** of food, which can be rough like an oyster shell or smooth like the skin of a tomato.

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Food can come in many shapes, sizes and forms.

Take an apple, for example. You can eat an apple whole, but also in quarters or even puréed. An apple can be green, yellow or red. It can be solid, but it can also be liquid, in the form of fruit juice.

IMPORTANCE OF SIGHT

Sight allows us to recognize food, to know whether we are going to like it or not and if it is ready to be eaten. For example, is the strawberry red enough and ripe enough to be picked and eaten?



More importantly, sight allows us to distinguish food that is edible from food that is poisonous.

We see very quickly whether food has gone off or is too old. However, sight does not give us the 'full' picture. Food may have gone bad, been spoilt or contaminated without it being possible to 'see' this. The reverse is also true. Fruit does not have to be perfect to taste good. For example, russet apples have blemishes and are wrinkled but they are nice and juicy!

SIGHT AND OUR EXPECTATIONS

Sight can influence us, but it can also mislead us. If the natural colour of food has been changed, it may not be appetizing any more. What would you say to a blue apple or green meat, for example?



Colours can also create expectations with regard to other perceptions. For example, red may be associated with a soft fruit, such as a strawberries and create the expectation of a strawberry flavour.



Similarly, yellow will be associated with bananas and green with mint.

Consequently, it may be easy to deceive someone by offering them red water that has a banana flavour or green water with an orange flavour.



EATING WITH YOUR EYES

One last point on the sense of sight. Seeing food can make us salivate and prepare to ingest and digest food even before it is in our mouths, hence the expression that we also 'eat with our eyes'.

1.1.1 Eating with your eyes

Which two types of stimuli do our senses perceive?

- Internal and external
- Physical and chemical
- Sweet and salty

Sight, hearing and touch respond to...

- chemical stimuli
- physical stimuli

What do we call 95% of the receptors in eyes?

- Cones
- Eskimos
- Rods

Which sense gives you the first impression of what you are going to eat?

- Taste
- Hearing
- Sight

What carries information from the eyes to the brain?

- The optician nerve
- The descriptive nerve
- The optic nerve

We can rely on the physical properties of fruit to know if it is ripe.

- True
- False

We can always rely on our sense of sight to know if food is suitable for eating.

- True
- False

How many receptors are there in a human eye?

- 100 million
- 1 billion
- 10 billion

Seeing food prepares us to digest it.

- True
- False

What is the outer layer of the eye called?

- The cornea
- The retina
- The trachea

Answers

Which two types of stimuli do our senses perceive?

- Internal and external**
Wrong! That's not the right answer.
- Physical and chemical**
Well done! Your senses enable you to perceive physical stimuli such as heat, and also chemical stimuli, such as tastes.
- Sweet and salty**
Wrong! These are both chemical stimuli perceived by your tongue.

Sight, hearing and touch respond to...

- chemical stimuli**
Wrong! Smell and taste respond to chemical stimuli.
- physical stimuli**
Well done! That's right!

What do we call 95% of the receptors in eyes?

- Cones**
Wrong! There are cones in your eyes, but they are in a minority compared to the other receptors.
- Eskimos**
Wrong! That was a trick answer.
- Rods**
Well done! Rods constitute the majority of the receptors in your eyes and are located on the outer edges of the retina.

Which sense gives you the first impression of what you are going to eat?

- Taste**
Wrong! Think about the first contact you have with food.
- Hearing**
Wrong! Try again!
- Sight**
Well done! Your sense of sight enables you to perceive food before you touch it or put it in your mouth.

What carries information from the eyes to the brain?

- The optician nerve**
Wrong! Try again!
- The descriptive nerve**
Wrong! Try again!
- The optic nerve**
Well done! That's right!

We can rely on the physical properties of fruit to know if it is ripe.

- True**
Wrong! Nice try, though.
- False**
Well done! Although sight provides you with initial information, your other senses confirm this first impression.

We can always rely on our sense of sight to know if food is suitable for eating.

- True**
Wrong! Try again!
- False**
Well done! Sight gives you a first impression, but food may be out of date or contaminated without showing any visible signs of this.

How many receptors are there in a human eye?

- 100 million**
Well done! That's right!
- 1 billion**
Wrong! It's less than that.
- 10 billion**
Wrong! It's much less.

Seeing food prepares us to digest it.

- True**
Well done! The mere sight of food can make us salivate and prepare our organs for digestion, before we have even tasted it.
- False**
Wrong! That's not the correct answer.

What is the outer layer of the eye called?

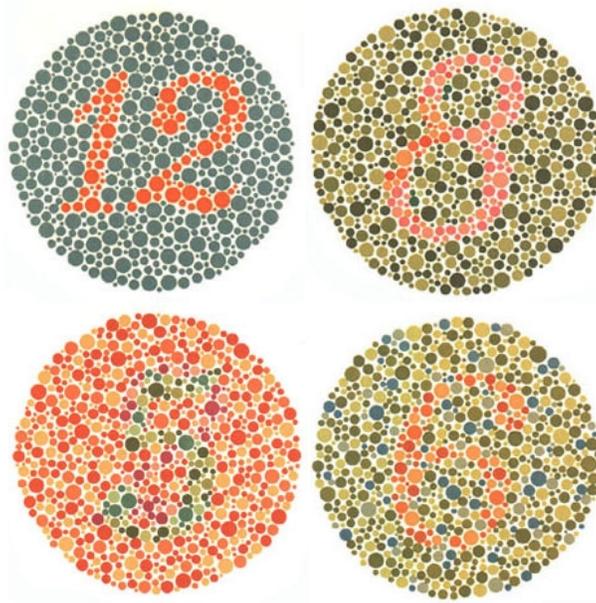
- The cornea**
Well done! That's right!
- The retina**
Wrong! The retina lines the inner surface of the eye.
- The trachea**
Wrong! Your trachea isn't in your eyes.

The Ishihara Test

[8-10 years old]

In 1917, Doctor Shinobu Ishihara invented a test to detect colour blindness.

Can you work out the numbers on the following plates?



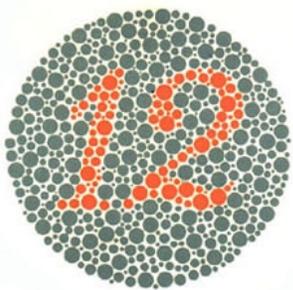
Answer

The Ishihara Test

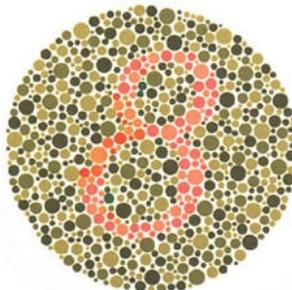
[8-10 years old and 11-13 years old and 14-16 years old]

In 1917, Doctor Shinobu Ishihara invented a test to detect colour blindness.

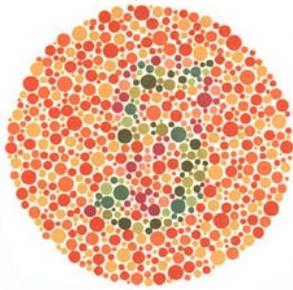
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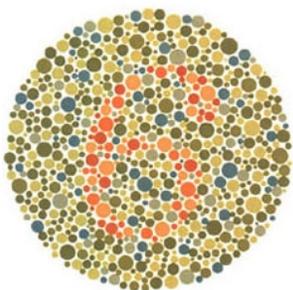
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