**Sight, hearing, touch, taste and smell**

1. Which sentence is **correct**? The sentences are about the black circles in your eyes, your pupils.

Hello! Today you are going to learn a lot about sight, hearing, touch, taste and smell. Perhaps you already know something about them? In that case you should be able to answer these questions. If you cannot answer them, don't worry. You will learn all about it today!

0 If you go from a dark place to a lighter place then the pupils in your eyes *do not change*.

0 If you go from a dark place to a lighter place then the pupils in your eyes become *smaller*.

0 If you go from a dark place to a lighter place then the pupils in your eyes become *larger*.

2. Which of the items does NOT belong?

pupils - eye - taste buds - seeing - images  
0 0 0 0 0

3. You are touching pillows. Which sense ensures that you feel how soft they are?

0 sight

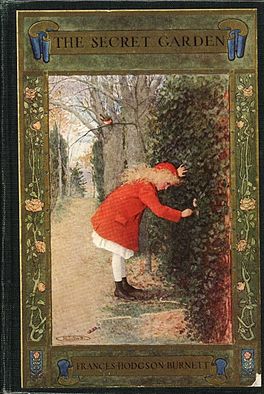
0 hearing

0 touch

0 taste

The secret garden

How do you know that the sky is blue, seawater tastes salty, freshly-baked bread smells good?  
You will discover the answer to these questions today!



Do you know the book or the film *The Secret Garden*? The book is more than 100 years old. It was written by Frances Burnett in 1911. It has been filmed several times.  
  
In the book 10-year-old Mary discovers a secret garden that has been locked for years and visited by no one. Mary finds the garden in the winter and thinks that all the plants are dead. But in the spring and summer she sees that this is not true. The garden is full of roses, trees, rosemary, thyme, ivy and lavender, etc. !   
She enjoys the delicious scent of the lavender and roses, the buzzing bees and chirping birds, the beautiful colours of all the flowers. She touches the soft moss and gets pricked by a rose thorn. She eats blackberries and apples from the trees.

The secret garden

Mary can enjoy the secret garden. She sees, touches, smells, hears and tastes the garden. In other words she **perceives** the garden.In order to do this, she uses her **senses**.

**What is a sense?**  
A sense is an organ that gives a person the opportunity to perceive the world.

Can you place Mary's experiences next to the correct sense?

|  |  |  |
| --- | --- | --- |
| Sight | stock photo : woman's brown eye | She eats blackberries and apples from the trees. |
| Hearing | stock photo : Human ear close-up isolated on white | She touches the soft moss.  She tastes the rosemary and thyme. |
| Touch | stock photo : Hand of a caucasian female pointing or pressing a button etc., isolated on white | She gets pricked by a rose thorn.  She enjoys the buzzing bees and chirping birds. |
| Taste | stock photo : Healthy woman teeth and smile. Close up. | She enjoys the beautiful colours of all the flowers. |
| Sense of smell | stock vector : Pop art nose | She enjoys the delicious smelling lavender and roses. |

Als juist: Good job! You found the correct combinations!

Als fout eerste keer: That is not completely correct. Try again.

Als fout tweede keer: That's not completely correct. Look at the correct answer carefully.

An image of the world

Your environment is changing all the time: the alarm goes off, someone turn on the radio, the school bell rings, a car honks its horn, the smell of soup comes from the school canteen... You notice all those changes with your **senses**. To get a good image of the world, your senses **work together**. Just think about a wild water ride at an amusement park: you see the boats and the water, you hear your neighbour laugh and shout, you feel the splashing water, you taste the water on your lips, you pass a food stand and smell waffles...

**Which senses do we have?**

|  |  |  |
| --- | --- | --- |
| **Sense &**  **perception** | **Part of the body** | **Kind of information & characteristics** |
| 1. Sight  **→ seeing** | stock photo : woman's brown eye eye | **Images** are received by the eyes.   Did you know that there is a **lens** in your eyes? The lens is protected from too much light by your **pupil**, the black circle in your eye. That pupil can become larger or smaller.  stock vector : man with big eye & magnifying glass Look at your neighbour: have them close their eyes and cover them with their hands for a minute. Then have them open their eyes. What happens to the pupils? If you did the experiment properly then you saw the pupils get smaller. When switching from dark to light the pupils will protect your lens by becoming smaller and allowing less light to enter. |
| 2. Hearing  **→ hearing** | stock photo : Human ear close-up isolated on white ear | **Sounds** are received by your ears. Your ears are also important for your **balance**.  Did you know that there are lots of body parts in your ears with strange names? There is a cochlea, an Eustachian tube, an eardrum, a hammer, an anvil and a stirrup bone. There are even little hairs in your ears! |
| 3. Sense of touch  **→ touching** | stock photo : Hand of a caucasian female pointing or pressing a button etc., isolated on white skin | You can feel with your skin: heat, cold, pain, pressure, itches... |
| 4. Sense of taste  **→ tasting** | stock photo : Healthy woman teeth and smile. Close up. tongue | With **taste buds** on your tongue you can taste salt, sweet, bitter and sour flavours. |
| 5. Sense of smell  **→ smelling** | stock vector : Pop art nose nose | The sense of smell works together with the sense of taste. Do you remember the last time you had a cold? When you have a blocked nose it is hard to taste your food! |



**Why do we have senses?**

Senses are very important for making **contact** with your environment. They can **warn** you about danger: when you hear a car and see it coming you will not cross the street. Your senses also ensure that you can **enjoy** the sun on your skin, the taste of ice cream, the scent of freshly-baked bread, etc.



**How do our senses work?**

Your brain **processes** all the information that your senses pick up. That happens very fast. For example, if a footballer gets the ball he must do several things really quickly:

|  |  |
| --- | --- |
| Step 1: Perceive | His eyes see the ball coming. |
| Step 2: Send | His eyes send this information to his **brain**. The information is sent via the **nerves**. |
| Step 3: Process | His brain processes the information. |
| Step 4: React | His brain tells his legs to stop the ball and to pass it to a team-mate. |

All this occurs very quickly: the footballer can do these four steps in less than one second!   
  
The information can travel even faster. Sometimes the information is so strong that it does not reach your brain. For example, if you put your hand on a hot pan you will feel pain and immediately pull your hand away from the pan. You pull your hand away in a **reflex**, an automatic and very fast action. You go from step 1 to step 4 right away without thinking about it.

An image of the world

Can you put these words in the correct column?

Images, sounds, scents, flavours,  
see, hear, touch, taste, smell,  
lens, pupil, taste buds,   
eyes, ears, skin, tongue, nose

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sight** | **Hearing** | **Sense of touch** | **Sense of taste** | **Sense of smell** |
|  |  |  |  |  |

Als juist: Great! You put all the words in the right column!

Als fout eerste keer: That is not completely correct. Try again.

Als fout tweede keer: Oops! That's not completely correct. Look at the correct answer carefully.

Is this an example of a reflex or of the fast processing of information in the brain? Link the five situations with the correct word.

|  |  |
| --- | --- |
| 1. Someone takes a photo of you and uses the flash. The flash causes you to blink your eyes. |  |
| 2. You hold a hot dish with oven gloves so that you don't burn your hands. | a. reflex |
| 3. Your leg gets too close to a hot stove. You quickly pull your leg away. |  |
| 4. You see a box fall off the shelf that you are standing next to. You quickly try to catch it. | b. fast processing of information in the brain |
| 5. Your alarm goes off in the morning. You jump out of bed immediately. |  |

Als juist: Excellent! That is correct!

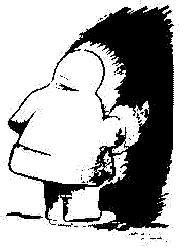
Als fout eerste keer: Oops! Some of these combinations are not correct. Try again.

Als fout tweede keer: Oops! That's not completely correct.

Nothing is what it seems!

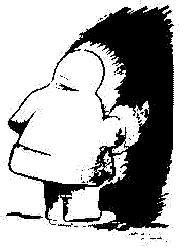
We use our senses to get an image of the world. But that image is not always correct: our senses can trick us!

Look at this drawing. What do you see?



Did you see the head of an Indian? Or did you see an Eskimo walking through the dark in a warm jacket? It is possible that you saw both of these!

|  |  |
| --- | --- |
| gezichtsbedrog info  **hair**  **eye**  **nose**  **mouth** | gezichtsbedrog info  **head**  **arms**  **legs** |
| **Indian** | **Eskimo** |

This drawing is an **optical illusion.**  
In one drawing you can see two figures: an Indian and an Eskimo.

**What you see is not always the same**  
What you see is *not always the same* even when you are looking at the same drawing.  
The first time that you see the drawing you usually see the head of an Indian. But if you continue looking at the drawing you suddenly see an Eskimo walking around in the dark. When you see the Eskimo it is difficult to see the Indian head once again.

**Looking with your brain**Your eyes do not determine what you see, your brain does that.

|  |  |
| --- | --- |
| Step 1: Perceive | Your eyes see the drawing of the Indian and the Eskimo. |
| Step 2: Send | Your eyes send this information to your brain. |
| Step 3: Process | Your brain processes the information. The first time that you see the drawing, you probably see the head of an Indian. If you keep staring at the drawing your brain will continue processing the drawing until you see the Eskimo. Yet the drawing did not change! |

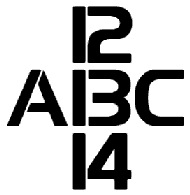
Here is another example of how your brain processes information. Take a good look at the sentence. Can you read the sentence?

|  |
| --- |
| It dose not mattre waht ordre the ltteers aer in.  If I look at the sentence long enough, I can read it! What it really says is:  'It does not matter what order the letters are in.' |

The letters of these words were mixed together. What your eyes see is wrong. But you can still read the text! That is because your brain automatically processes the incorrect words and turns them into the correct words. We helped your brain a bit by writing the first letter of every word correctly. So your eyes see something incorrect but your brain turns it into something correct!

**Looking with your brain**

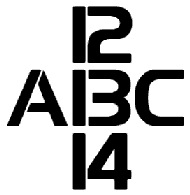
Here is another example of an **optical illusion**.   
Look at this row. What do you read?



Click to the next page

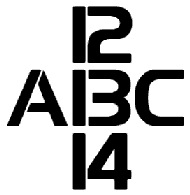
**Looking with your brain**

What do you read now?



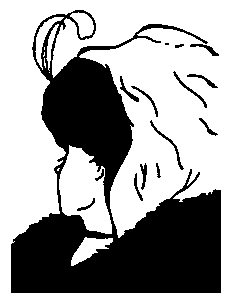
Click to the next page!

**Looking with your brain**

- From left to right you read A**B**C,  
- From top to bottom you read 12 **13** 14.  
  
Yet the letter or the number in the blue box remained the same.

Nothing is what it seems!

Look at this drawing. What do you see? You can choose two answers!



0 An old woman

0 A tree

0 A bird

0 A young woman

0 A rabbit

0 A butterfly

Als juist: Well done! In the drawing you do indeed see an old woman and a young woman.

Als fout eerste keer: That's not completely correct. Look at the drawing again and choose your answer.

Als fout tweede keer: That's not completely correct. In the drawing you see an old woman and a young woman. Have a look!

|  |  |
| --- | --- |
| **headscarf**  **eyes**  **nose**  **mouth**  woman | **woman**  **hair**  **eye**  **ear**  **chin** |
| **Old woman** | **Young woman** |

Which of these lines do you think is the longest?

|  |  |
| --- | --- |
| Line 1 |  |
| Line 2 |

0 Line 1 is longer than line 2.

0 Line 2 is longer than line 1.

0 Lines 1 and 2 are the same length.

Als juist: Well done! The lines are the same length, but at first sight you might think that line 2 is longer. The figures at the end of the lines make your brain process the length of the lines differently.

Als fout eerste keer: That's not correct. Try again.

Als fout tweede keer: That's not correct. Lines 1 and 2 are the same length, but at first sight you might think that line 2 is longer. The figures at the end of the lines make your brain process the length of the lines differently. Hold a ruler up to the screen and compare the two lines!

1. Waffles are sweet. Which sense ensures that you taste how sweet they are?

0 sight

0 hearing

0 sense of touch

0 sense of taste

Als juist: Good job!

Als fout: Incorrect. Your **sense of taste** ensures that you taste how sweet the waffles are.

2. Which sentence is **not true**?

0 If you go from a dark place to a lighter place then the pupils in your eyes become smaller.

0 Pupils regulate the light that enters your eyes in order to protect your eye lens.

0 Pupils process the information that your eyes collect.

0 If you go from a light place to a darker place then the pupils in your eyes become bigger.

Als juist: Great!

Als fout: Oops! This sentence is correct. The incorrect sentence is 'Pupils process the information that your eyes collect.' Your pupils do not process information, your brain does that.

3. Which of the items does not belong?

hearing - sound - ear - balance - lens  
0 0 0 0 0

Als juist: Correct! Good job! There is a lens in your eye. All the other words belong to your ears.

Als fout: Oops! This is not the correct answer. You should have touched 'lens'. There is a lens in your eye. All the other words belong to your ears.