

# **EXPERIMENTING**

## **The Nervous System and the Senses**

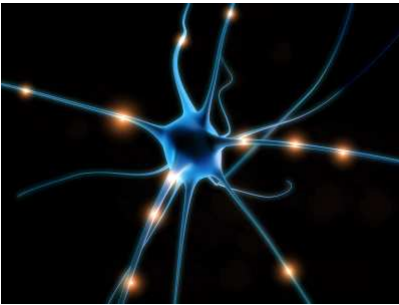
### **(Student's worksheets)**

Jordi Bassa i Esteve

Nottingham, January-April 2009

## Lesson 1 Session 1

## Worksheet 1

**Hi, I'm Nervy!**

I'm going to introduce myself. I'm Nervy but I'm not something material, I'm only an electrical impulse of your body.

My favourite sport is running; running around your body to catch information and give orders.

Yes, I catch the information that a part of your body notes and quickly, at 460 km/h, I give this information to your brain.

After that, your brain interprets this information and gives me an answer. I carry this answer and at the same speed, I go to the part of the body that your brain tells me to and this part of the body does what the brain wants.

Do you understand me?

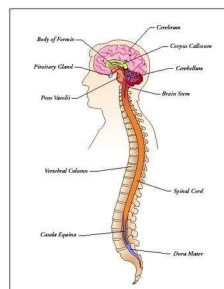
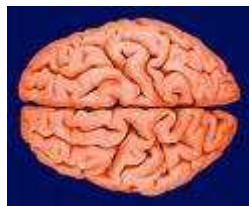
I'm afraid this is not that easy. Let me give you an example.

Imagine that you are walking around the street. Suddenly a traffic light appears in front of you. The traffic light turns red and.....you stop!



This lasts only a half a second, but in this short moment a lot of events happen.

First your eyes see the red light and they give me the information. I catch the information and following the nerves, and the spinal cord, I go to the brain and give it this information.



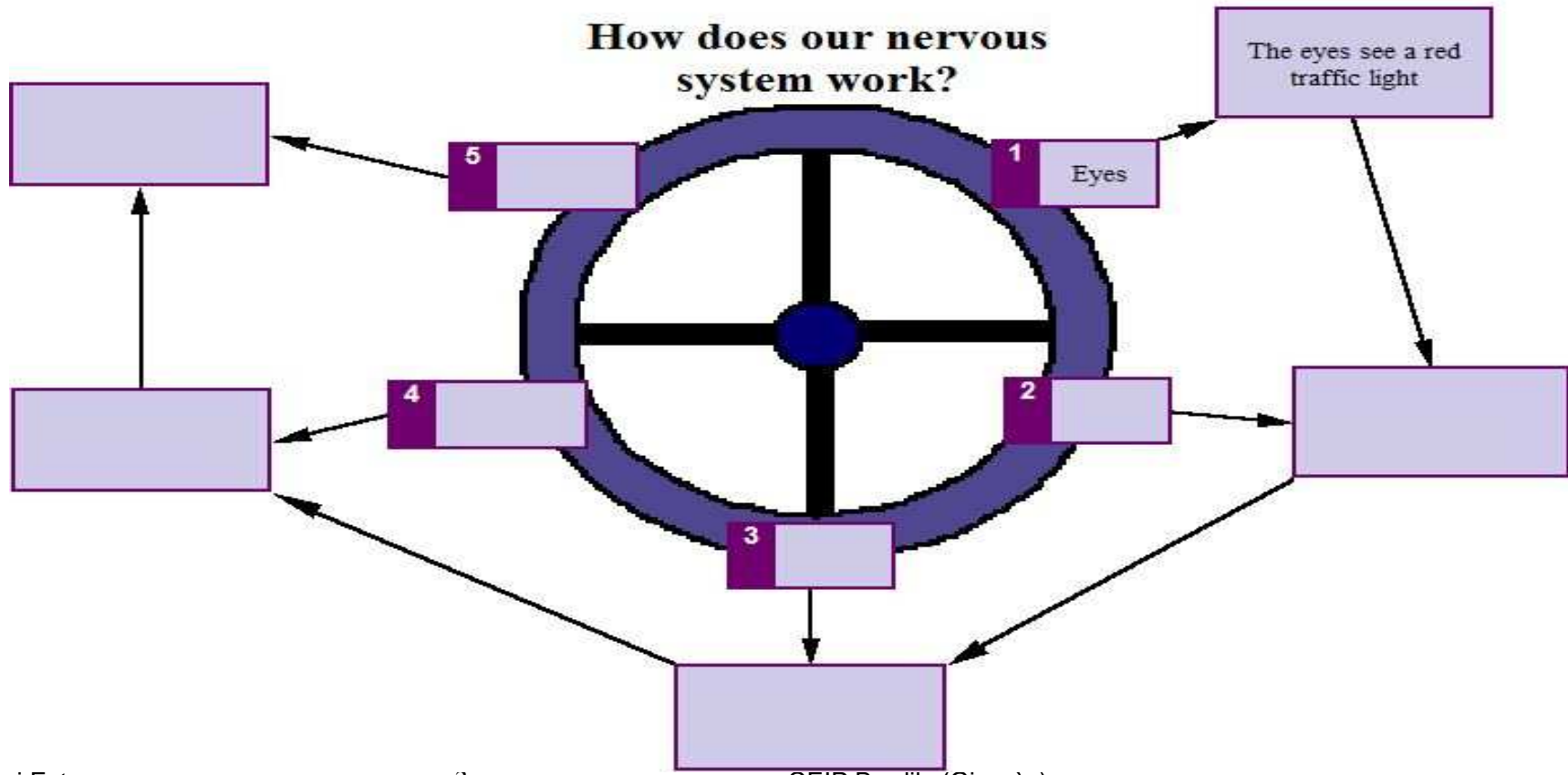
Then your brain interprets this code and thinks 'Red light means STOP!' and it gives me an order for the legs.

I start a new trip through the spinal cord and the nerves of the leg. I give this order to the muscles and the legs stop.

Is it clear, now? Of course, you are so clever!!!!!!

*Lesson 1 Session 1*  
**WORKSHEET 2**

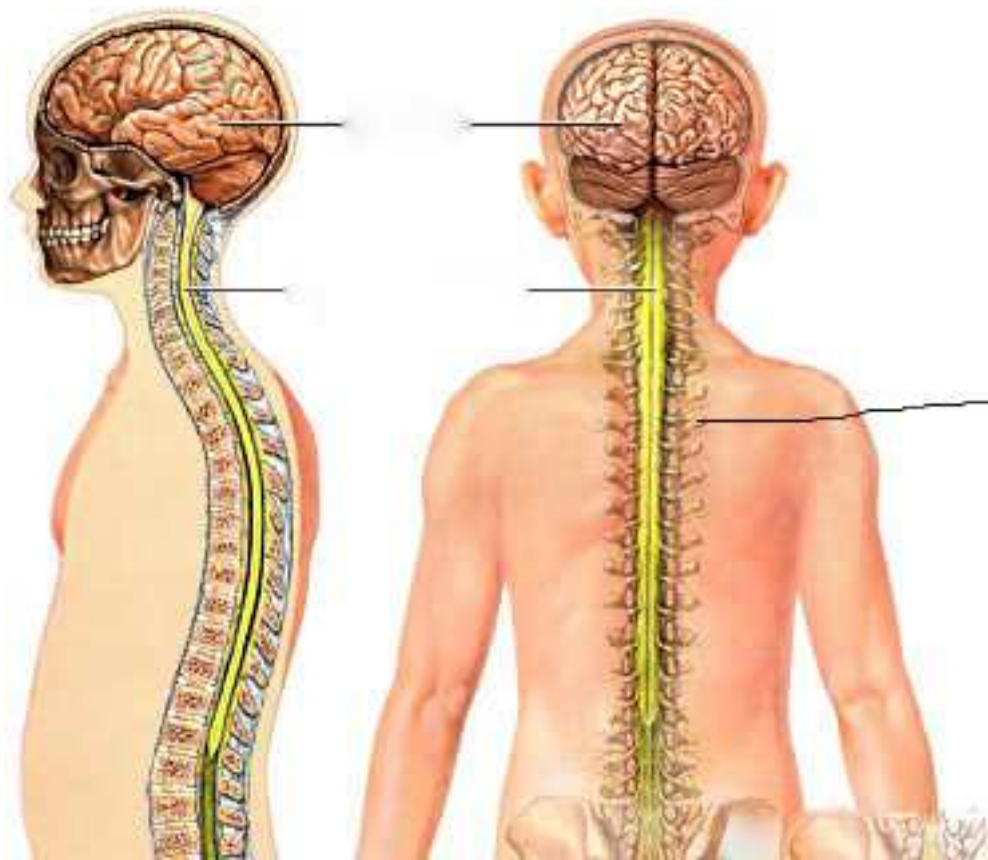
Read the text and afterthat, in pairs, try to complete this wheel using these sentences and words:  
 Numbered squares:  
 BRAIN-MOUTH-NERVES&SPINAL CORD-NOSE-LEGS-EYES-EARS  
 Squares:  
 The legs obey the order and stop themselves.  
 The information travels through the nerves&the spinal cord.  
 The brain decodes the message and sends an order to the legs.



**THE HUMAN BODY**

Write the parts of the body that are related with the nervous system in its correct place

## NERVES- BRAIN- SPINAL CORD



*Lesson 1 Session 2**Worksheet 4a*

FIRST GROUP: The brain and its parts. How does the brain work?

Your group has to look for information about the brain. Here there are some books and some web pages that you can use to do your Power-point.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is "forbidden" to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about this part to ask your classmates

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- Maynard, C. *How Your Body Works*. Knowledge MASTERS. Alligator Books Limited. London-2006
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- Bingham, C *Human Body: Enter a world of discovery*. DK Eyewonder. Penguin company. London-2003
- McMillan- Heinemann First Encyclopedia. 2008.
- <http://kidshealth.org/kid/htbw/brain.html> (brain and nervous system)
- <http://yucky.discovery.com/noflash/body/pg000135.html> ( brain)
- <http://yucky.discovery.com/noflash/body/pg000136.html> (nervous system)
- <http://www.pbs.org/wnet/brain/> (The secret life of the brain)
- <http://www.innerbody.com/image/nervov.html> (Human anatomy on-line)

*Lesson 1 Session 2**Worksheet 4b***SECOND GROUP: The spinal cord and the nerves.**

Your group has to look for information about the spinal cord and the nervous system. It's very important to explain how the nervous system is and how it works. Here there are some books and some web pages where you can find the information needed.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about this part to ask your classmates

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*Lesson 1 Session 2**Worksheet 4c***THIRD GROUP: The senses and their organs (general view)**

Your group has to look for information about the senses and the parts of the body that are related with them. It's only a general view and you don't have to specify too much. Here there are some books and some web pages where you can select the information.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is "forbidden" to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about this part to ask your classmates

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- <http://www.innerbody.com/image/nervov.html> (Human anatomy on-line)
- <http://faculty.washington.edu/chudler/introb.html> (Neuroscience for kids)
- <http://www.cyh.com/HealthTopics/HealthTopicDetailsKids.aspx?p=335&np=152&id=2612> (Kid's Health- The nervous system)
- [http://pennhealth.com/health\\_info/body\\_guide/reftext/html/nerv\\_sys\\_fin.html](http://pennhealth.com/health_info/body_guide/reftext/html/nerv_sys_fin.html) (nervous system)

## Lesson 2 Session 1

## Worksheet 5

# The Nose Knows!

TRY THIS EXPERIMENT WITH A FRIEND



Name:

Level:

Everyone knows that you taste food with your mouth, right? Well, not quite. See what happens if you can't **smell** what you're eating. You will need:

- glass of water
- grater
- blindfold
- plate
- paper towel
- 1/4 teaspoon
- four spoons
- peeled apple       peeled pear
- lemon rind       orange rind
- peeled raw potato       peeled raw carrot
- peeled raw onion       peeled raw turnip

(You may also try other foods.)

- pencil and experiment form

Wash your hands and grate small portions of each food. Wash the grater after each use. Place 1/4 teaspoon of apple onto a spoon. Wash the 1/4-teaspoon and do the same with the other three foods. Arrange the spoons on a plate and cover them with a paper towel.

Blindfold a friend and lead him or her into the kitchen. Have your friend pinch his or her nose tightly and taste a spoonful of food. The samples should be rolled on the tongue, not chewed. Wait a minute or two, and then ask your friend to identify the food. Write down the results. Your friend should rinse with water and repeat the procedure for each food.





Your friend's name:.....

What foods did your friend identify correctly? Tick if your partner has guessed the food.

APPLE

GOT IT RIGHT!  GUESSED WRONG!

CARROT

GOT IT RIGHT!  GUESSED WRONG!

LEMON RIND

GOT IT RIGHT!  GUESSED WRONG!

ONION

GOT IT RIGHT!  GUESSED WRONG!

ORANGE RIND

GOT IT RIGHT!  GUESSED WRONG!

PEAR

GOT IT RIGHT!  GUESSED WRONG!

POTATO

GOT IT RIGHT!  GUESSED WRONG!

TURNIP

GOT IT RIGHT!  GUESSED WRONG!

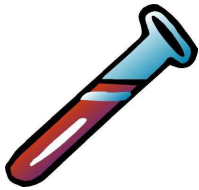
What foods were easier to identify?

What role does smell play in identifying foods?

Adaptation of <http://www.nationalgeographic.com/media/world/9703/nose>

Lesson ... Session ...

Worksheet 6



## SCIENCE EXPERIMENT



Children in the group:

Title for the experiment

**QUESTION:** What are you investigating?

**MATERIALS/ EQUIPMENT:** What are you going to use?

**HYPOTHESIS:** What do you expect to happen?/ What do you think you will see?

**THE EXPERIMENT STEP BY STEP:**



**DATA RESULTS:** A diagram/writing/picture/list/table...about your experiment.



**CONCLUSIONS:**

1. What happened? What did you observe?

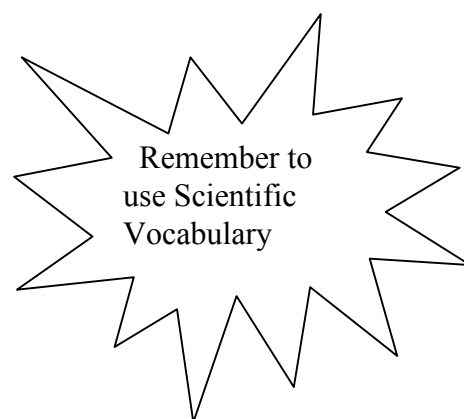
2. We have to demonstrate or refute your hypothesis.



3. Look at your hypothesis- Was it correct or not?

4. What's your opinion about the experiment?

5. What have you learnt?



*Lesson 2 Session 2**Worksheet 7a***FIRST GROUP- The sense of taste: Parts of the mouth.**

Your group has to look for information about the sense of taste. It's so important to explain the parts of the mouth and how the brain works. Here there are some books and some web pages that you can use to do your Power-point.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about this part to ask your classmates

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- <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/T/Taste.html> (taste receptors)
- <http://faculty.washington.edu/chudler/tasty.html> (Neuroscience for kids- flavours)
- <http://faculty.washington.edu/chudler/chtaste.html> (Taste experiments)
- <http://faculty.washington.edu/chudler/taste.html> (Taste lesson plan)
- <http://www.nidcd.nih.gov/health/smelltaste/taste.asp> (Taste disorders)
- [http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP14104](http://www.wisc-online.com/objects/index_tj.asp?objID=AP14104) (Taste learning activity)
- <http://library.thinkquest.org/3750/taste/taste.html> (Taste)
- <http://www.innerbody.com/htm/body.html> (Human anatomy)
- <http://www.starsandseas.com/SAS%20Physiology/Neurology/Taste.htm> (taste)

**SECOND GROUP- How taste works. The flavours**

Your group has to look for information about the flavours and how taste works. It's very important to explain the four flavours and how they are located in our mouth. Here there are some books and some web pages where you can find the information needed.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about the flavours to ask your classmates

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*Lesson 2 Session 2**Worksheet 7c***THIRD GROUP- Taste and health. How taste and smell are related.**

Your group has to look for information about taste and health and also you have to explain how taste and smell are related. Here there are some books and some web pages where you can select the information.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

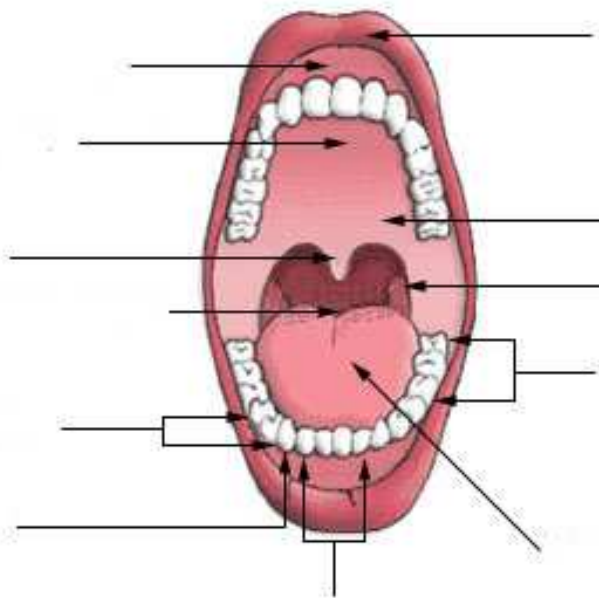
Remember to write some questions about how to train our taste to ask your classmates.

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*Lesson 2 Session 3**Worksheet 8***THE SENSE OF TASTE. PARTS OF THE MOUTH.**

If you have paid attention you can write each name in its correct place.

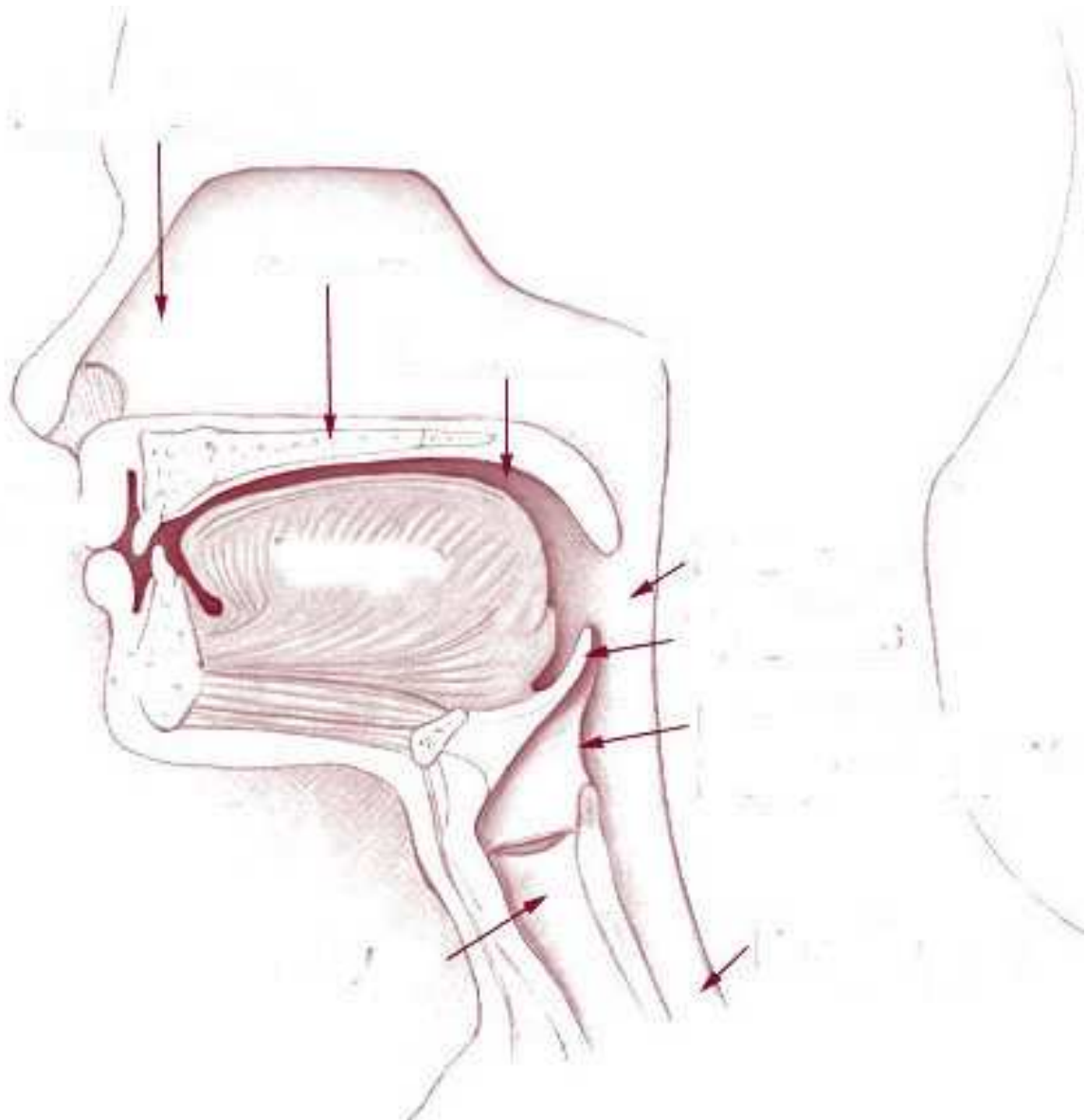
**Mouth (Oral Cavity)**

CANINE TEETH- GINGIVA- HARD PALET- INCISOR TEETH-  
LIPS- MOLAR TEETH- PALATINE TONSIL- PAPILLAE OF  
TONGUE- PREMOLAR TEETH- SOFT PALATE- TONGUE-  
UVULA

## Lesson 2 Session 3

## Worksheet 9

If you have paid attention you can write each name in its correct place.



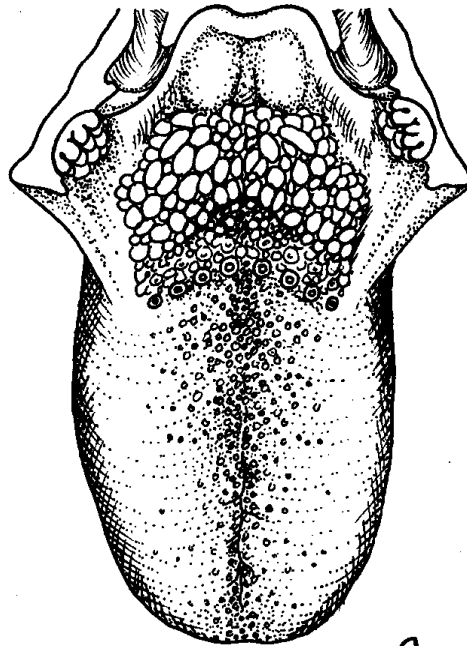
EPIGLOTIS- ESOPHAGUS- JAW- LARYNX- LARYNX OPENING INTO  
PHARYNX- LIPS- NASAL CAVITY- ORAL CAVITY- PALATE- PHARYNX-  
TONGUE



**SECOND GROUP: HOW TASTE WORKS. THE FLAVOURS**

1. Can you remember how many flavours there are? Write their name on this tongue.

SWEET, SOUR, BITTER, SALTY, UMAMI



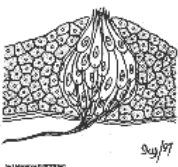
*9/97*

Ivy Livingstone © BIODIDAC

2. Can you complete this text about the taste buds or the gustative receptors?

The actual organ of \_\_\_\_\_ is called the \_\_\_\_\_ Each taste bud (and there approximately 10,000 taste buds in \_\_\_\_\_) is made up of many (between 50-150) \_\_\_\_\_ Receptor cells live for only 1 to 2 \_\_\_\_\_ and then are replaced by \_\_\_\_\_ receptor cells. Each receptor in a taste bud responds best to one of the basic tastes. A receptor can respond to the other tastes, but it responds \_\_\_\_\_ to a particular taste.

**The Taste Bud**



TASTE, TASTE BUD, RECEPTOR CELLS, WEEKS, HUMANS, NEW, STRONGEST

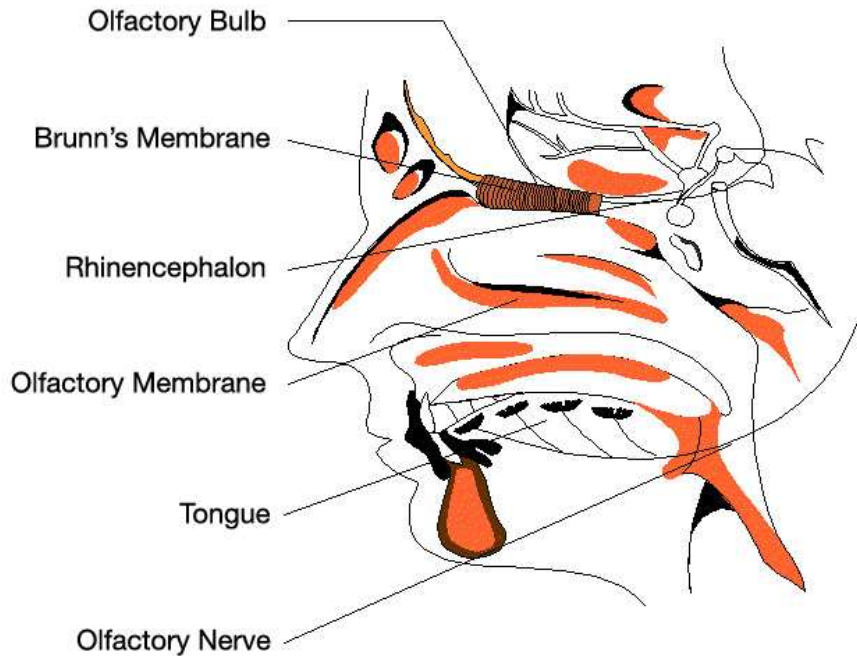
Image from Biodidac

## TASTE AND HEALTH. HOW TASTE AND SMELL ARE RELATED.

After looking for the information can you complete this question quiz? Sometimes more than an answer would be correct.

1. What is a taste disorder?
  - A. Inability to perceive different flavours.
  - B. Inability to perceive different smells.
  - C. Inability to perceive different sounds.
  
2. What are the tastes disorders?
  - A. **Hypogeusia**: diminished sensitivity to taste.
  - B. **Aguesia**: loss of the sense of taste.
  - C. **Amnesia**: don't remember the name of the flavours.
  
2. What causes taste disorders? Taste disorders may result from:
  - A. Poor oral hygiene
  - B. Gum disease, hepatitis, or medicines and chemotherapeutic drugs.
  - C. a very bad cold
  - C. Taste disorders may also be neurological.
  - D. Poor feet hygiene.
  
3. How are taste disorders diagnosed?
  - A. Taking a bath in a swimming pool
  - B. Using a taste testing.
  - C. It can't be diagnosed.
  
4. Are taste disorders serious?
  - A. No
  - B. Yes
  
5. Can taste disorders be treated?
  - A. Yes
  - B. No
  - C. I don't know.
  
6. What can I do to help myself?
  - A. I can go to the optician
  - B. I can go to the chemist
  - C. I can go to the otolaryngologist.
  - D. I can't do anything.

**Sense of Smell and Taste**



Here there is a graphic about the senses of taste and smell. Can you explain if these senses are related? No. Then read this text and catch the main idea.

‘ Smell and taste work together to help you enjoy your food. A delicious smell tells your brain that the food will taste good!

When you have a cold and can't smell very well, your food doesn't taste as strong as usual.

You use your senses of smell and sight, as well as your sense of taste, to tell you what you are eating.”

(Sally Hewitt, 2005)

The main ideas are

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*Lesson 3 Session 1**Worksheet 13*

PUPILS: \_\_\_\_\_ Level \_\_\_\_\_

Item	What is it?	Rate the odour (strong, pleasant, unpleasant, neutral, ...)	I like/ don't like this smell.	This odour reminds me of....
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				

After that you have to complete the 'Science Experiment worksheet' (Worksheet 6).

### **FIRST GROUP- The sense of smell: Parts of the nose**

Your group has to look for information about the sense of smell. It's important to explain the parts of the nose and how the brain works. Here there are some books and some web pages that you can use to do your Power-point.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about how to train our taste to ask your classmates.

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<http://www.cf.ac.uk/biosi/staffinfo/jacob/teaching/sensory/olfact1.html> (Smell in general)

<http://faculty.washington.edu/chudler/nosek.html> (Smell- The nose knows)

<http://www.tsbvi.edu/Outreach/seehear/summer05/smell.htm> (smell)

[http://scifiles.larc.nasa.gov/text/kids/Problem\\_Board/problems/stink/smell2b.html](http://scifiles.larc.nasa.gov/text/kids/Problem_Board/problems/stink/smell2b.html) (smell and memory)

<http://www.nidcd.nih.gov/health/smelltaste/smell.asp> (smell disorders)

**SECOND GROUP- How smell works. Different odours.**

Your group has to look for information about the odours and how smell works. It's very important to explain how the odours arrive in our nose. Here there are some books and some web pages where you can find the information needed.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about how to train our taste to ask your classmates.

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**THIRD GROUP- Smell and health. How taste and smell are related.**

Your group has to look for information about smell and health (smell disorders) and also you have to explain how taste and smell are related. Here there are some books and some web pages where you can select the information.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about how to take care our smell to ask your classmates.

**BOOKS AND WEB PAGES**

- Walker, R. *The Human Machine*. Oxford University Press. 2008
- Maynard, C. *How Your Body Works*. Knowledge MASTERS. Alligator Books Limited. London-2006
- Oxlade, C. *Why, why, why does my heart begin to race?* Miles Kelly Publishing. Essex-2005
- Bingham, C *Human Body: Enter a world of discovery*. DK Eyewonder. Penguin company. London-2003
- McMillan- Heinemann First Encyclopedia. 2008.
- Wilkes, Angela *Human Body. Question Time collection*. Kingfisher Publishers. London-2001
- Hewitt, Sally. *Smell it!*. Let's start science. QED Publishing. London-2005

<http://library.thinkquest.org/3750/smell/smell.html> (Smell)

[http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP14004](http://www.wisc-online.com/objects/index_tj.asp?objID=AP14004) (Smell learning activity)

<http://www.cf.ac.uk/biosi/staffinfo/jacob/teaching/sensory/olfact1.html> (Smell in general)

<http://faculty.washington.edu/chudler/nosek.html> (Smell- The nose knows)

<http://www.tsbvi.edu/Outreach/seehear/summer05/smell.htm> (smell)

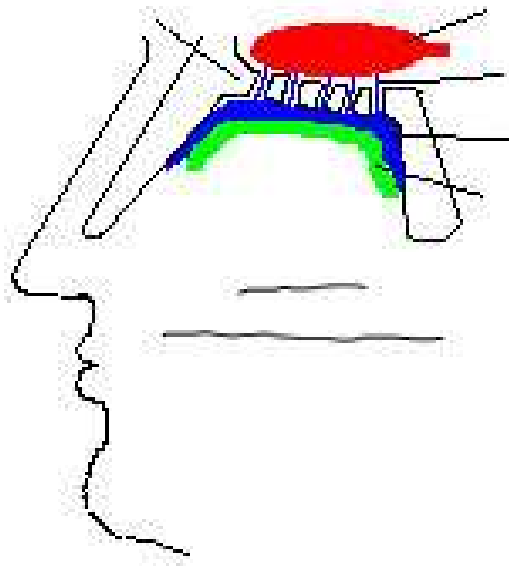
[http://scifiles.larc.nasa.gov/text/kids/Problem\\_Board/problems/stink/smell2b.html](http://scifiles.larc.nasa.gov/text/kids/Problem_Board/problems/stink/smell2b.html) (smell and memory)

<http://www.nidcd.nih.gov/health/smelltaste/smell.asp> (smell disorders)

## EXERCISE 1

Write the different organs used for the sense of smell

CRIBIFORM PLATE- INNER CHAMBER NOSE-  
MUCUS OLFACTORY BULB- OLFACTORY  
EPHITELIUM- OLFACTORY NERVES-





## **EXERCISE 2**

Can you answer these questions after looking at this web page?

[http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP14004](http://www.wisc-online.com/objects/index_tj.asp?objID=AP14004)

1. How many smells can we discern?
2. How many different receptors types do we have?
3. Where are the olfactory receptor cells?
4. What do chemicals have to do to be 'smelled'?
5. Where do the sensory impulses travel along?
6. Where is the cortex for smell interpretation located?
7. What part of our body does the right hemisphere control?

## EXERCISE 3

How are smell and taste related? Do you remember the experiment 'The nose knows'?

### Questions

1. Which sense, taste or smell, identified the correct flavour most often?
2. How were the "taste" messages your brain received different from the "smell" messages?
3. How do you think sweet makers simulate fruit flavours?
4. Why do you taste more flavour when you chew a jellybean than when you suck on it?

## Do you know the smell disorders and their causes?

### Questions

1. Can you define hyposmia?
2. Can you define anosmia?
3. Can you name 3 possible causes of a smell disorder?
4. What is an otolaryngologist?

## **FIRST GROUP- The sense of hearing: Parts of the ear.**

Your group has to look for information about the sense of hearing. It's important to explain the parts of the ear. Here there are some books and some web pages that you can use to do your Power-point.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about this part to ask your classmates

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- Hewitt, Sally. *Hear this! Let's start science*. QED Publishing. London-2005
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- <http://www.britishsignlanguage.com/> (British Sign Language)
- <http://en.wikipedia.org/wiki/Deafness> (deafness)
- <http://faculty.washington.edu/chudler/hearing.html> (Sense of Hearing)
- <http://adam.about.com/encyclopedia/Sense-of-hearing.htm> (Sense of hearing. Very easy)
- <http://en.wikipedia.org/wiki/Sound> (sound waves)
- <http://www.youtube.com/watch?gl=GB&v=s9GBf8y0lY0> (sound waves video)
- <http://library.thinkquest.org/3750/hear/hear.html> (your sense of hearing)
- [http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP14204](http://www.wisc-online.com/objects/index_tj.asp?objID=AP14204) (Learning activity)
- <http://www.cf.ac.uk/biosi/staffinfo/jacob/teaching/sensory/ear.html> (The ear)
- [http://scifiles.larc.nasa.gov/text/kids/Problem\\_Board/problems/sound/lab.html](http://scifiles.larc.nasa.gov/text/kids/Problem_Board/problems/sound/lab.html) (sound activities)
- <http://faculty.washington.edu/chudler/bigear.html> (the ear and hearing loss)
- [http://kidshealth.org/PageManager.jsp?dn=KidsHealth&lic=1&ps=307&cat\\_id=118&article\\_set=22412](http://kidshealth.org/PageManager.jsp?dn=KidsHealth&lic=1&ps=307&cat_id=118&article_set=22412) (Taken care of your ear)
- [http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP1502](http://www.wisc-online.com/objects/index_tj.asp?objID=AP1502) (Anatomy of the ear)

Lesson 4 Session 2

Worksheet 18b

**SECOND GROUP- How hearing works. The sound waves**

Your group has to look for information about the sound waves and how hearing works. It's very important to explain how the sound arrives in the inner ear and how it travels to the brain. Here there are some books and some web pages where you can find the information needed.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt.

Remember to write some questions about the flavours to ask your classmates

**BOOKS AND WEB PAGES**

- Walker, R. *The Human Machine*. Oxford University Press. 2008
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- [http://scifiles.larc.nasa.gov/text/kids/Problem\\_Board/problems/sound/lab.html](http://scifiles.larc.nasa.gov/text/kids/Problem_Board/problems/sound/lab.html) (sound activities)
- <http://faculty.washington.edu/chudler/bigear.html> (the ear and hearing loss)
- [http://kidshealth.org/PageManager.jsp?dn=KidsHealth&lic=1&ps=307&cat\\_id=118&article\\_set=22412](http://kidshealth.org/PageManager.jsp?dn=KidsHealth&lic=1&ps=307&cat_id=118&article_set=22412) (Taken care of your ear)
- [http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP1502](http://www.wisc-online.com/objects/index_tj.asp?objID=AP1502) (Anatomy of the ear)

### **THIRD GROUP- Hearing and health. The sign language.**

Your group has to look for information about hearing and health and also you have to explain how deaf people use sign language. Here there are some books and some web pages where you can select the information.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about how to train our hearing to ask your classmates.

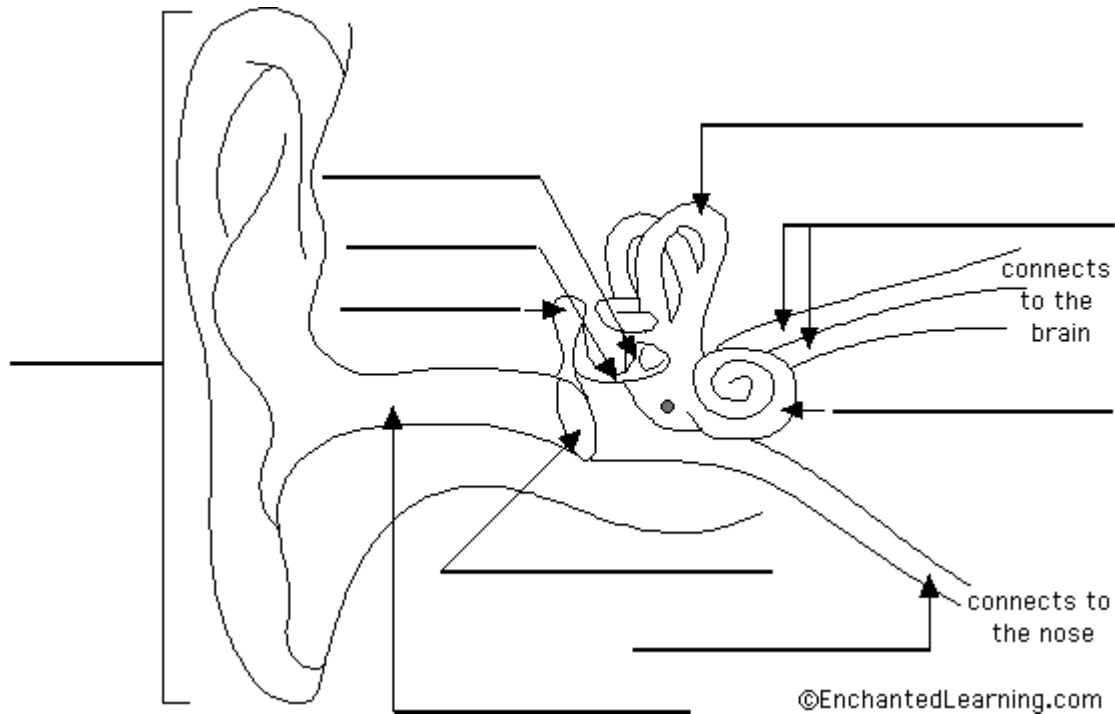
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- Hewitt, Sally. *Hear this! Let's start science*. QED Publishing. London-2005
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- <http://www.britishsignlanguage.com/> (British Sign Language)
- <http://en.wikipedia.org/wiki/Deafness> (deafness)
- <http://faculty.washington.edu/chudler/hearing.html> (Sense of Hearing)
- <http://adam.about.com/encyclopedia/Sense-of-hearing.htm> (Sense of hearing. Very easy)
- <http://en.wikipedia.org/wiki/Sound> (sound waves)
- <http://www.youtube.com/watch?gl=GB&v=s9GBf8y0IY0> (sound waves video)
- <http://library.thinkquest.org/3750/hear/hear.html> (your sense of hearing)
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- <http://www.cf.ac.uk/biosi/staffinfo/jacob/teaching/sensory/ear.html> (The ear)
- [http://scifiles.larc.nasa.gov/text/kids/Problem\\_Board/problems/sound/lab.html](http://scifiles.larc.nasa.gov/text/kids/Problem_Board/problems/sound/lab.html) (sound activities)
- <http://faculty.washington.edu/chudler/bigear.html> (the ear and hearing loss)
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- [http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP1502](http://www.wisc-online.com/objects/index_tj.asp?objID=AP1502) (Anatomy of the ear)

## Lesson 4 Session 3

## Worksheet 19

Can you remember the name?



If you need some help, remember that you can visit the web pages again, but here you are the words that you must use.

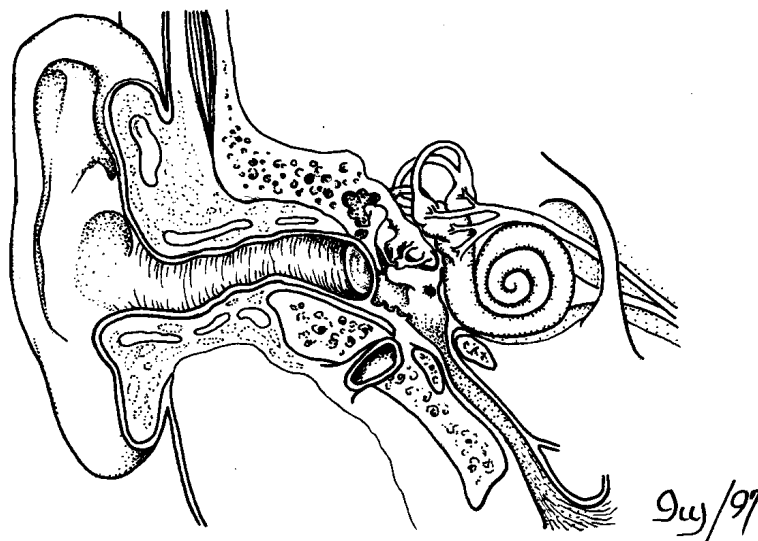
ANVIL- COCHLEA- EARDRUM- EUSTACHIAN TUBE- HAMMER- NERVES-  
OUTER EAR CANAL- PINNA- SEMICIRCULAR CANALS- STIRRUP (STRAPES)

Here is a little text explaining how the sense of hearing works.  
Can you complete it?

The flap, called \_\_\_\_\_ on your head is only a part of your ear, the \_\_\_\_\_ ear. The hole in your ears, goes to a tiny piece of tight skin, called an \_\_\_\_\_. Sounds enter your ear and make the eardrum \_\_\_\_\_, move in and out. Here starts the \_\_\_\_\_ ear. Tiny bones pass the movements to the \_\_\_\_\_, which is shaped like a snail. The cochlea, in the \_\_\_\_\_ ear, contains thousands of tiny \_\_\_\_\_. It is also full of liquid. Sounds make the liquid move. This makes the hairs wave about. Tiny sensors pick up the waving and through the \_\_\_\_\_ send messages to your \_\_\_\_\_ so you hear the sound.

COCHLEA- EARDRUM- HAIRS- BRAIN- OUTER- MIDDLE- INNER-  
AUDITORY NERVE- PINNA- VIBRATE

Now, with a red pencil, draw the way that the sounds follows from the exterior of your ear to the auditory nerve.



Ivy Livingstone © BIODIDAC

*Lesson 4 Session 3**Worksheet 21***ACTIVITY 3**

Your work will be very easy. By surfing on the web ( <http://www.britishsignlanguage.com/> )you'll learn some words using sign language.

You have to learn:

- Days of the week
- What's your name?
- Colours: red, yellow and blue.

It seems difficult but it is not!!!. Enjoy your work, and remember that there are a lot of people that use sign language because they can't hear any sound - they are deaf.



## **FIRST GROUP- The sense of touch: Parts, functions and characteristics of the skin**

Your group has to look for information about the sense of touch. It's important to explain the parts of the skin, its functions and characteristics. Here there are some books and some web pages that you can use to do your Power-point.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about this part to ask your classmates

## **BOOKS AND WEB PAGES**

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- Maynard, C. *How Your Body Works*. Knowledge MASTERS. Alligator Books Limited. London-2006
- Oxlade, C. *Why, why, why does my heart begin to race?* Miles Kelly Publishing. Essex-2005
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- Wilkes, Angela *Human Body. Question Time collection*. Kingfisher Publishers. London-2001
- Hewitt, Sally. *Touch that! Let's start science*. QED Publishing. London-2005

<http://library.thinkquest.org/3750/touch/touch.html>

<http://library.thinkquest.org/28457/touch.shtml>

[http://www.1stholistic.com/Beauty/skin/skin\\_parts-of-the-skin.htm](http://www.1stholistic.com/Beauty/skin/skin_parts-of-the-skin.htm) (parts of skin)

[http://www.pg.com/science/skincare/Skin\\_tws\\_39.htm](http://www.pg.com/science/skincare/Skin_tws_39.htm) (functions of skin)

<http://www.dermatologyinfo.net/english/chapters/chapter02.htm> (functions of skin)

<http://www.starsandseas.com/SAS%20Physiology/Neurology/Touch.htm> (touch receptors)

<http://library.thinkquest.org/05aug/00386/touch/index.htm> (All about skin and touch)

<http://www.physpharm.fmd.uwo.ca/undergrad/sensesweb/L7Touch/L7Touch.swf> (Flash learning activity)

<http://www.youtube.com/watch?v=d-IJhAWrsm0&feature=related> (Video about parts of the skin)

<http://kidshealth.org/kid/htbw/skin.html> (Skin)

[http://kidshealth.org/kid/stay\\_healthy/body/skin\\_care.html](http://kidshealth.org/kid/stay_healthy/body/skin_care.html) (Taking care of your skin)

<http://www.innerbody.com/htm/body.html> (anatomy)

## **SECOND GROUP- How touch works . Different receptors.**

Your group has to look for information about the different receptors that we have in our skin, and the try to explain how the sense of touch works. It's very important to explain how the receptors work. Here there are some books and some web pages where you can find the information needed.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about the receptors to ask your classmates

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- Maynard, C. *How Your Body Works*. Knowledge MASTERS. Alligator Books Limited. London-2006
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<http://www.innerbody.com/htm/body.html> (anatomy)

### **THIRD GROUP- Sense of touch and health .**

Your group has to look for information about touch and health and also you have to explain how you can take care of your skin. Here there are some books and some web pages where you can select the information.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about how to take care of our skin to ask your classmates.

## **BOOKS AND WEB PAGES**

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- Maynard, C. *How Your Body Works*. Knowledge MASTERS. Alligator Books Limited. London-2006
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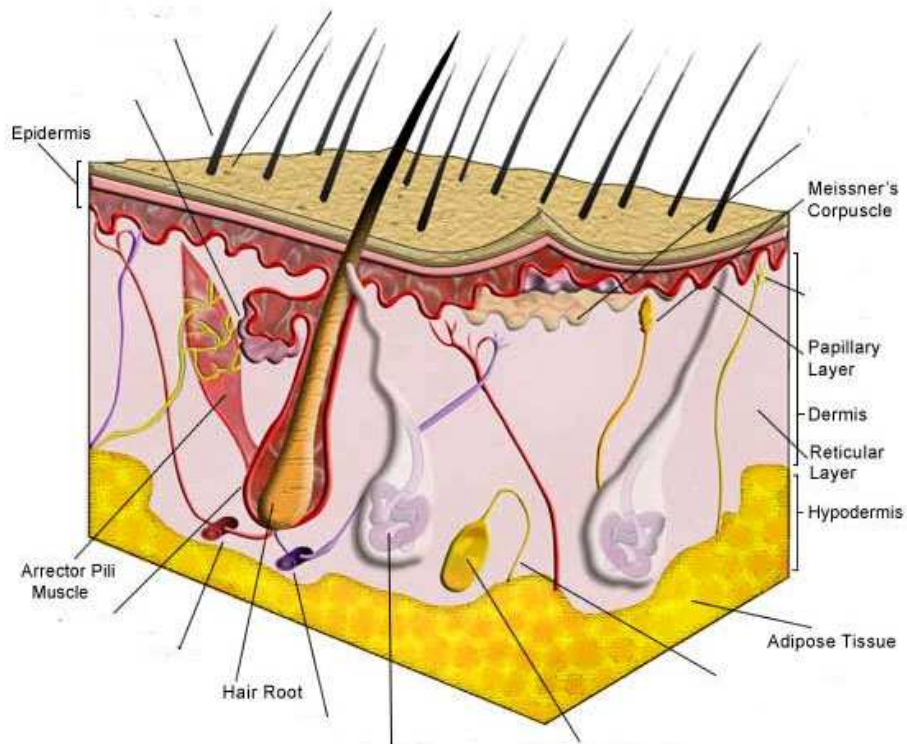
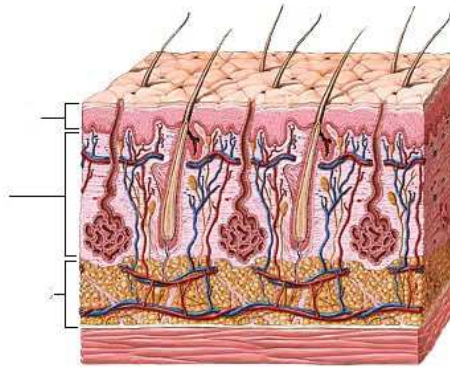
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<http://www.innerbody.com/htm/body.html> (anatomy)

**ACTIVITY 1**

Can you complete this skin picture? Here you are the names you need in alphabetical order.

ARTERY- DERMAL PAPILLA- DERMIS- EPIDERMIS- FREE NERVE ENDING-  
HAIR- HAIR FOLICLE- HYPODERMIS- PACINIAN CORPUSCLE- PORE-  
SEBACEOUS GLAND- SENSORY NERVE FIBRE- SWEAT GLAND- VEIN



*Lesson 5 Session 3**Worksheet 24***ACTIVITY 2****Link:**

FREE NERVE ENDING

COLD

PACINIAN CORPUSCLE

TACTILE

MEISSNER'S CORPUSCLE

PRESSURE

END-BULB OF KRAUSE

PAIN

RIFFINI'S END ORGAN

HEAT

**ACTIVITY 3**

Choose the correct answer:

1. What is called the bottom layer of the skin?
  - a. Epidermis
  - b. Underdermis
  - c. Dermis
  - d. Hair follicle
  
2. How do blind people read?
  - a. By instinct
  - b. By Braille Alphabet.
  - c. By Osmosis
  - d. They don't.
  
3. Where is the least sensitive place on your body?
  - a. Tongue
  - b. Upper leg
  - c. Finger
  - d. Middle of the back.
  
4. Where is located the sense of touch?
  - a. All over your body
  - b. On your hands
  - c. In your mouth
  - d. In the spinal cord.
  
5. There are about \_\_\_\_\_ touch receptors in each of your fingertips.
  - a. 10
  - b. 100
  - c. 1000
  - d. 32.125

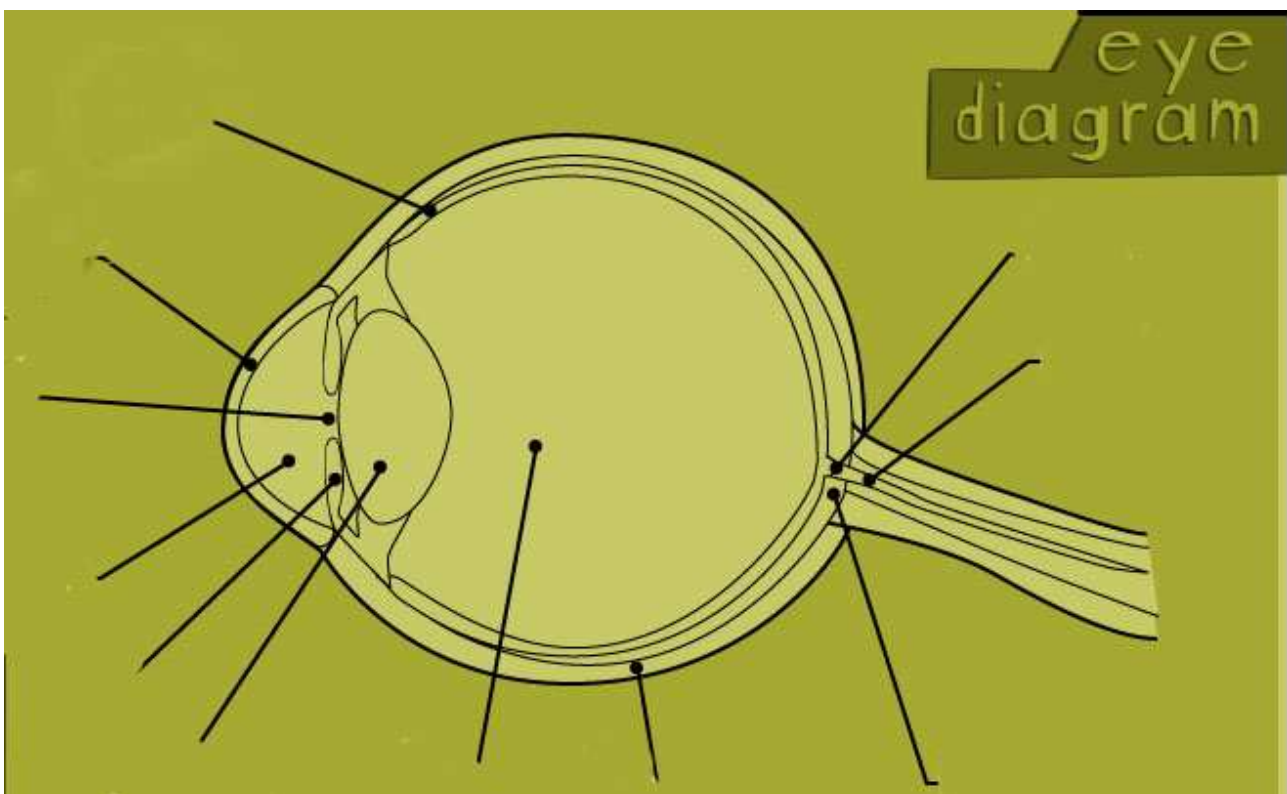
6. One of the most sensitive areas of your body is...
- your knee
  - your neck
  - your nose
  - your back
7. When your body gets warmer it starts to...
- run
  - laugh
  - become red
  - shiver
8. What are the structures called that respond to touch stimuli and cause a nerve impulse to be generated.
- epidermis
  - touch receptors
  - hypodermis
  - dermis
9. Some areas of your body are more sensitive because...
- They have no nerve endings
  - They have less nerve endings
  - They have more nerve endings
  - They have the same number of nerve endings.
10. A touch receptor is...
- a hair root
  - a neuron
  - a blood vessel
  - a special nerve ending.

**VIDEO OF THE EXPERIMENT**

This is the experiment that we are going to do in the first session. In this activity we have to look at the video about a cow eye dissection.

[http://exploratorium.com/learning\\_studio/cow\\_eye/index.html](http://exploratorium.com/learning_studio/cow_eye/index.html)

After the video we have to take notes and complete this diagram:





**COW'S EYE DISECTION EXPERIMENT**

In this session we are going to do the cow's eye dissection in groups of 2-3.

Download and print the instructions from:

[http://exploratorium.com/learning\\_studio/cow\\_eye/doi.html](http://exploratorium.com/learning_studio/cow_eye/doi.html)

Lesson 6 Session 3

Worksheet 28a

## **FIRST GROUP- The sense of sight: Parts, functions and characteristics of the eye**

Your group has to look for information about the sense of sight. It's important to explain the parts of the eye, its functions and characteristics. Here there are some books and some web pages that you can use to do your Power-point.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about this part to ask your classmates

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- Walker, R. *The Human Machine*. Oxford University Press. 2008
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- Oxlade, C. *Why, why, why does my heart begin to race?* Miles Kelly Publishing. Essex-2005
- Bingham, C *Human Body: Enter a world of discovery*. DK Eyewonder. Penguin company. London-2003
- McMillan- Heinemann First Encyclopedia. 2008.
- Wilkes, Angela *Human Body. Question Time collection*. Kingfisher Publishers. London-2001
- Hewitt, Sally. *Look here ! Let's start science*. QED Publishing. London-2005

<http://www.innerbody.com/htm/body.html> (Anatomy)

[http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP14304](http://www.wisc-online.com/objects/index_tj.asp?objID=AP14304) (Sight learning activity)

<http://library.thinkquest.org/3750/sight/sight.html> (The eye sight)

<http://faculty.washington.edu/chudler/eyetr.html> (Eye anatomy and function. )

[http://www.sightsavers.org/learn\\_more/the\\_eye/default.html?gclid=CMLTzPmIvJkCFQ0zQgodj2136w](http://www.sightsavers.org/learn_more/the_eye/default.html?gclid=CMLTzPmIvJkCFQ0zQgodj2136w) (Eye problems, how we see, the eye in detail, etc)

[http://www.sightsavers.org/learn\\_more/causes\\_of\\_blindness/default.html](http://www.sightsavers.org/learn_more/causes_of_blindness/default.html) (Blindness)

[http://www.sightsavers.org/learn\\_more/fun\\_and\\_games/optical\\_illusions/default.html](http://www.sightsavers.org/learn_more/fun_and_games/optical_illusions/default.html) (optical illusions)

[http://en.wikipedia.org/wiki/Eye\\_protection](http://en.wikipedia.org/wiki/Eye_protection) (Eye protection)

## **SECOND GROUP- How sight works**

Your group has to look for information about how the sense of sight works. It's very important to explain how correct eyesight works. Here there are some books and some web pages where you can find the information needed.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about the eye to ask your classmates

## **BOOKS AND WEB PAGES**

- Walker, R. *The Human Machine*. Oxford University Press. 2008
- Maynard, C. *How Your Body Works*. Knowledge MASTERS. Alligator Books Limited. London-2006
- Oxlade, C. *Why, why, why does my heart begin to race?* Miles Kelly Publishing. Essex-2005
- Bingham, C *Human Body: Enter a world of discovery*. DK Eyewonder. Penguin company. London-2003
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<http://library.thinkquest.org/3750/sight/sight.html> (The eye sight)

<http://faculty.washington.edu/chudler/eyetr.html> (Eye anatomy and function. )

[http://www.sightsavers.org/learn\\_more/the\\_eye/default.html?gclid=CMLTzPmIvJkCFQ0zQgodj2136w](http://www.sightsavers.org/learn_more/the_eye/default.html?gclid=CMLTzPmIvJkCFQ0zQgodj2136w) (Eye problems, how we see, the eye in detail, etc)

[http://www.sightsavers.org/learn\\_more/causes\\_of\\_blindness/default.html](http://www.sightsavers.org/learn_more/causes_of_blindness/default.html) (Blindness)

[http://www.sightsavers.org/learn\\_more/fun\\_and\\_games/optical\\_illusions/default.html](http://www.sightsavers.org/learn_more/fun_and_games/optical_illusions/default.html) (optical illusions)

[http://en.wikipedia.org/wiki/Eye\\_protection](http://en.wikipedia.org/wiki/Eye_protection) (Eye protection)

### **THIRD GROUP- Protection of your eyes, imperfect eyesight and blindness.**

Your group has to look for information about blindness; imperfect eyesight and also you have to explain how you can protect your eyes. Here there are some books and some web pages where you can select the information.

The power point will have only 3-4 slides. Each slide has to contain one photo and a sentence. It is forbidden to cut and paste. You have to write a little sentence explaining something about the content you've learnt

Remember to write some questions about how to take care of our eyes to ask your classmates.

## **BOOKS AND WEB PAGES**

- Walker, R. *The Human Machine*. Oxford University Press. 2008
- Maynard, C. *How Your Body Works*. Knowledge MASTERS. Alligator Books Limited. London-2006
- Oxlade, C. *Why, why, why does my heart begin to race?* Miles Kelly Publishing. Essex-2005
- Bingham, C *Human Body: Enter a world of discovery*. DK Eyewonder. Penguin company. London-2003
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<http://faculty.washington.edu/chudler/eyetr.html> (Eye anatomy and function. )

[http://www.sightsavers.org/learn\\_more/the\\_eye/default.html?gclid=CMLTzPmIvJkCFQ0zQgodj2136w](http://www.sightsavers.org/learn_more/the_eye/default.html?gclid=CMLTzPmIvJkCFQ0zQgodj2136w) (Eye problems, how we see, the eye in detail, etc)

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[http://www.sightsavers.org/learn\\_more/fun\\_and\\_games/optical\\_illusions/default.html](http://www.sightsavers.org/learn_more/fun_and_games/optical_illusions/default.html) (optical illusions)

[http://en.wikipedia.org/wiki/Eye\\_protection](http://en.wikipedia.org/wiki/Eye_protection) (Eye protection)

**WEB QUEST: The Nervous System. The senses.****The Task**

1. You should explore the listed sites and find important information, articles, pictures, etc that help to answer the main questions about the nervous system and the senses.
2. When you find information, you should check the copyright notice and/or possibly ask for permission from the webmaster to use that material.
3. Copy any text you want by dragging across the words, then using the Edit - Copy command on the menu bar. Paste what you highlighted into a basic text editor, word processor, and create a folder called 'Nervous system' in

T:/level/Name/ Science Project/

4. In this folder you should save the 'Nervous System Journal', a word document where you should copy the texts that you might need.
5. Save images you like by downloading them. Save the images you've downloaded into the folder previously created.
6. Be prepared to cut anything that copyright owners tell you they don't want you to have.
7. Once you have collected your information, you have to prepare a presentation for your classmates.

**The Process**

After completing this Web Quest, you will be creating a presentation of the nervous system, the senses and how they work.

Step 1: Work with a partner to begin your tour of the nervous system.

Step 2: Research the various parts of the nervous system and the five senses by using the links provided throughout your tour.

Step 3: During your tour, you will need to use your "Nervous System Journal" (Word) to take notes and to save pictures of each of the three (3) main parts of the nervous system: the brain, spinal cord, and nerves.

Step 4: Use your “Nervous System Journal” to take notes and to save pictures of each of the five (5) senses: sight, hearing, smell, taste, and touch.

Step 5: After completing your tour of the nervous system, you and your partner will need to do a presentation of the nervous system. More information can be found at the end of the tour.

Now you can click on this link to do the Nervous System Web Quest:

<file:///D:/Lesson%20Plans/NERVOUS%20SYSTEM%20Web%20quest2.htm>