

## 1) Creativity

In this round we did research about the neurons and how it works. While we were debating about the topics we create different ideas about neurons because it was a bit difficult ,complicated and abstract issue. Without seeing neuron in microscope it is hard to describe it briefly. Therefore , sometimes we had different kind of ideas about the structure of neurons and create our own neuron structure. When we saw the picture and draws about neurons we agreed that it was look like a tree. Both shapes and functions are similar. Dendrites looks like root of a tree and body of tree over the soil looks like a axon and soma. Also both neurons and the parts of the trees has a transportation function.



## 2) Theory and Research

### What is neuron ?

A neuron is a nerve cell that is the basic building block of the nervous system. Neurons are similar to other cells in human body, but there is one key difference between neurons and other cells. Neurons are specialized to transmit information throughout the human body. These specialized nerve cells are responsible for communicating information in both chemical and electrical forms. Also there are different types of neurons which are responsible for different tasks in the human body.

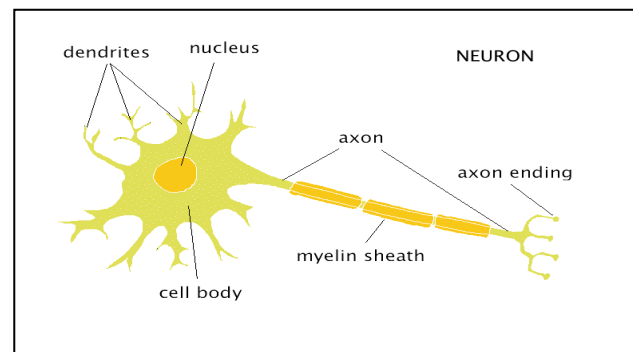
**Sensory neurons:** They carry information from the sensory receptor cells throughout the body to brain.

**Motor neurons:** They transmit information from the brain to the muscles of the body

**Interneurons :** These neurons are responsible for communicating information between different neurons in the body.

### What do neurons look like?

They are not seen without the aid of a microscope. However researcher says that when we do get to see them, we see that they have a very specialized structure. There are three parts of neuron: the dendrites, the cell body (soma) and the axon. They have cell body or "soma" and fine processes that run from it. These processes are split into two types, dendrites carry the incoming information in the form of electrical impulses, to the soma. The action potential leaves via the axon. Axons can be very short or very long. Axon size can be changed according to gap between communicating cells.



## Jan Evangelista Purkyně(1787-1869)

Jan Evangelista Purkyně was a 19th century Czech physiologist, anatomist and biologist. He was born in December 17, 1787 in Bohemia. He graduated from Charles University in Prague. His experimental physiological investigations in the field of histology, embryology and pharmacology helped to create modern understanding of the eye and vision, brain and heart function. He discovered the Purkinje effect, the human eye's much reduced sensitivity to dim red light compared to dim blue light. He studied nerve cells and their fibers, describing their different characteristics in different parts of the nervous system. He used a mechanical cutter to make very thin slices of tissue for staining and microscopy and showed how to perceive the shadows of the one's own retinal blood vessels.

## The Sense of Taste

Taste is the ability to respond to dissolved molecules and ions. Humans detect taste with taste receptor cells. These are grouped together in taste buds. Each taste bud has a pore that opens out to the surface of the tongue, enabling molecules and ions taken into the mouth to reach the receptor cells inside.

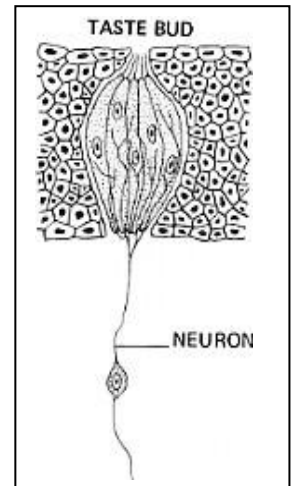
A single taste bud contains 50-100 taste cells representing all 5 taste sensations (so the classic textbook pictures showing separate taste areas on the tongue are wrong.)

Each taste cell has receptors on its surface. These are which;

- \* admit the ions that give rise to the sensation of salty,
- \* bind to the molecules that give rise to the sensation of sweet and bitter.

A stimulated taste receptor cell triggers action potentials in a nearby sensory neuron leading back to the brain.

The sensation of taste resides in the brain.



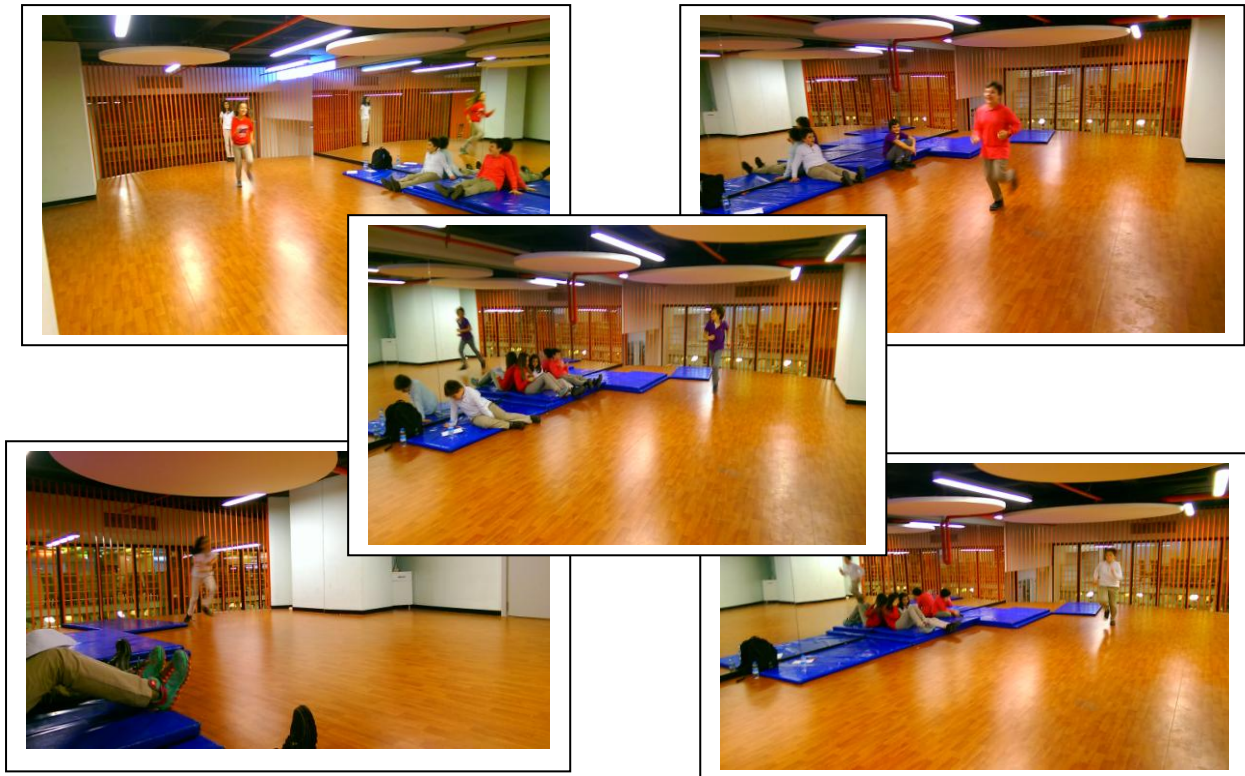
## 3) Practice and Project

Before we began the project, we had a debate on our prior knowledge about the relationship between neurons and human body functions. We knew that neurons play an active role in human body functions. Therefore we decided to do practice about one of the functions of the human body, which is heart rate. We knew that when we do training, our heart rate is increased. We tested if it is true or not? For this purpose we measured 5 students' heart rate during 3 minutes of training.

**Materials:** 1) Polar GPS3 Heart Rate Watch 2) Polar Heart Beat Sensor



**Practice:** We planned that 5 students run for a 3 minutes and we measured their heart beat rates.



**Results:**

Name	Min Heart Rate	Max Heart Rate	Average Heart Rate
Alper	98bpm(%49)	189bpm(%95)	154bpm(%77)
İdil	93 bpm (%47)	183bpm (%92)	156bpm (%78)
Selda	95 bpm (%47)	170bpm (%83)	145bpm (%73)
Fevzi Alp	105bpm (%53)	191bpm (%96)	162bpm (%81)
Mehmet Akif	102bpm(%51)	177bpm(%89)	153bpm(%77)

**Conclusion:**

After we completed all measurement and collected datas. We understood that our prior knowledge was true and we concluded that heart beat rate is increased while we are traning. Then we made a quick research on it and we found that neurons plays an active role on heart beat rate.

During training session our muscles were working and they need more oxygen . How they get these oxygen? Neurons plays an important role on this situations. When muscles needs oxygen neurons transport this informations to the brain and brain makes aquick reaction to that and sending new information to heart for pumping more blood(containing oxygen) to the muscles.Then our heart start to beat faster.So muscles get these oxygen molecules throughout the blood.