

**Project FOCUS
Best Lessons
FIFTH GRADE**

Title of Lesson: Synaptic Tag

Theme: Life Science

Unit Number: 1 **Unit Title:** Cells and Microorganisms

Performance Standard(s) Covered (enter codes):

S7L2

S5L3a

S5L3b

SB1

Enduring Standards (objectives of activity):

Habits of Mind

- Asks questions
- Uses numbers to quantify
- Works in a group
- Uses tools to measure and view
- Looks at how parts of things are needed
- Describes and compares using physical attributes
- Observes using senses
- Draws and describes observations

Content (key terms and topics covered):

cells, animal cell, plant cell, cell wall, cell membrane, organ, mitochondria, chloroplast, neuron, synaps, synaptic, nervous system, Axon, enzyme, neurotransmitter

Learning Activity (Description in Steps)

Abstract (limit 100 characters): Students are taught the basics about the nervous system.

Details: I began the lesson by introducing the class with the basic information about the nervous system. I explained the different division and made sure that they understood the difference. I then explained the basic function of the nervous system, the neuron. I showed a picture of the neuron and identified its basic parts: the dendrite, which receives signals, and the axon, the part a signal is sent down. After feeling confident that the class understood the material, I took them outside to demonstrate how signals are sent.

Once outside, I set up cones in a rectangle shape. On one shorter side of the rectangle, six kids with balls in their hands stand waiting. The ball is supposed to represent the neurotransmitter. The area before they enter into the rectangle boundary represents the end of the axon, known as the presynaptic cleft. In the area of the rectangle, three kids stand, waiting for the neurotransmitter to be “released”. These three kids are “it”, and they represent enzymes. Enzymes deactivate neurotransmitters. If the neurotransmitter is deactivated, then it must return to the axon and wait for the next turn. This demonstrates the neurotransmitter being reabsorbed by the axon. On the other side of the rectangle, other students stand waiting to receive the ball (neurotransmitter). These kids represent a target organ. I explained to the class that if a neurotransmitter reaches its target organ, a task is performed by that organ. I used the example that a muscle cell receives a signal and contracts. To add fun to the activity, when a neurotransmitter safely reaches its target

organ, the neurotransmitter passes the ball to a target organ student. Now the target organ must perform a task. Since we did this activity on a basketball court, the task of the target organ was to make a shot in the basketball hoop. The object of the game is to get as many neurotransmitters across the synapse to the target organ without being caught (deactivated) by the enzyme. It is like a game of tag.

Materials Needed (Type and Quantity):

The presentation should cover the divisions of the nervous system. It should also cover information about nerves, as well as the structure and functions of neurons. Pictures on the presentation are helpful.

For the activity part, you will need around six balls and four cones. I went to the gym and picked up six basketballs and four cones. The activity can be performed on grass or concrete.

Notes and Tips (suggested changes, alternative methods, cautions):

Background Information:

The students were required to learn about different body systems in order to be prepared to take the CRCT. I had been trying various ways on how to present the material. Since the student's textbook only had one page covering the nervous system, I had to do some research. I found this activity on a Texas fifth grade body systems web site. I modified the activity in a way to add competition to learning. The students and I first had discussion on the nervous system. I presented the material through a PowerPoint presentation. After I felt the students understood the material, I took them outside and walked them through the activities. After the activity was over, I questioned the kids about everything that was happening.

Safety Issues:

For the "synaptic tag" activity, students should be dressed the same as if they were in PE. The activity involves running, so you might want to make sure all the students have on proper footwear to ensure nobody slips.

Possible Questions:

1. What are the two divisions of the nervous system?
2. Name parts of a neuron?
3. Which end of the neuron receives a signal? Which end sends a signal?
4. Would a person still be able to move if they had no nerves? Explain.

Assessment/Evaluation:

I asked the questions above before and after each activity. As we went along, more and more kids could answer the questions. By the end of the activities, I had the kids gather around me. I would call on certain students and ask them different forms of the questions above. Having the whole class participate and switching out which role each student played helped the students identify and understand the parts of a neuron, as well and understand how neurons worked in their bodies. You could also make a written quiz using the questions above.

Sources/References:

- 1) Harcourt Science Publishers "Science Grade 5"
- 2)
- 3)