

## MY NERVOUS SYSTEM AND REACTIONS

### Section

Traumatic experiences are situations in which an individual feels physically or emotionally threatened. During such experiences, the brain activates its alarm system, focusing on survival. This brain alarm system is connected to structures such as the amygdala, hippocampus, and prefrontal cortex. The amygdala detects danger, the hippocampus records this experience in memory, and the prefrontal cortex is responsible for thinking, planning, and decision-making. However, a brain under constant stress can particularly suppress the functions of the prefrontal cortex. This can manifest in students as attention deficit disorder, learning difficulties, emotional volatility, or behavioral problems.

Therefore, as teachers, it is important to evaluate students' behavior not only through the lens of "discipline," but also from a nervous system perspective. Students who have experienced trauma may appear anxious, angry, or withdrawn from an external perspective. However, these reactions are actually the brain's way of coping with an overstimulated threat system. The trust, predictability, connection, and compassion provided in the classroom help calm the student's nervous system and balance brain functions. Through this activity, students will understand the relationship between trauma and the brain and understand that some of their reactions are among the nervous system's methods of protecting itself.

### Lesson

Science

### Grade

6

### Learning Objectives

Sinir sistemini, merkezî ve çevresel sinir sisteminin görevlerini model üzerinde açıklar

### Duration

1 Ders Saati (40 Dakika)

### Required Materials

- Colored cards,
- Printouts related to the nervous system (pictures showing brain regions, neural networks, and images of the central and peripheral nervous systems)
- Strings,
- Cardboard background
- Science Lesson Activity Evaluation Form (printouts are required for the number of students)

### Preparation and Implementation

## ACTIVITY DESCRIPTION

### 1 INTRODUCTION (5 Minutes)

"Dear Children, we all have a very special system within us that is invisible but controls us: the nervous system! This system works like a telephone line between our brain and our entire body. Whenever we sense we're in danger or become overly excited, our nervous system immediately takes over and tries to protect us. Sometimes our heart beats faster, sometimes our hands shake, and sometimes we find ourselves unable to say anything. These are all reactions of our nervous system. Today, we will try to understand this system more closely and discover what it is trying to tell us."

"Have you ever been very afraid or suddenly felt very angry? What did you feel in your body at that moment? Did you notice any changes in your heart, breathing, or hands?" she asks, allowing students to connect the topic with examples from their own experiences.

### 2 DISCUSSION - (5 Minutes )

Students are asked what they know about the nervous system. Incorrect information is corrected, and correct information is summarized on the board.

### 3 APPLICATION (30 Minutes)

Öğrencilerin içinden sinir sisteminin farklı kısımlarını canlandırmak isteyenler için kimlerin gönüllü olmak istedikleri sorulur

Students are divided into groups, each group representing a part of the nervous system.

● The flow of information within the nervous system is simulated through a stimulus (e.g., "putting your hand on a hot surface"). The outputs of the nervous system (pictures depicting brain regions, neural networks, and images of the central and peripheral nervous systems) are presented to the students performing the role-plays. The functions of each nervous system segment are explained to the students. After ensuring that the students have learned the necessary information about the parts and functions of the nervous system, the role-play begins with the question, "How does our body react when we put our hand on a hot surface?"

The question, "How is the brain affected in a traumatic event?" prompts students to interpret their findings based on their existing knowledge. The teacher then explains the following to the class:

*"Children, when we experience a traumatic event—sometimes something very scary or upsetting—our brain immediately activates. There's a structure in the middle of our brain called the amygdala. When this structure detects danger, it sends signals as if an alarm is going off. At that moment, our bodies activate three different responses: flight, fight, or freeze. Our heart accelerates, our breathing changes, and our muscles tense. All of these are natural protective responses."*

*"However, if the danger persists for a long time, or if a person feels constantly threatened, this brain alarm system remains active for a very long time. This can cause them to feel restless, tense, irritable, or tired. In such situations, our brains need to calm down, be in a safe environment, and receive support. By supporting each other in the classroom and creating a safe environment, we can send the message to each other's brains, 'You are safe now.'"*

## TEACHER FEEDBACK

At the end of the lesson, each student is given the following form and asked to bring it to the next lesson:

Science Lesson Activity Evaluation Form

Activity Name: The Nervous System and Brain Responses to Traumatic Situations

Grade: 6th Grade

Date: .....

A. Student Evaluation Form

1. Closed-Ended Questions (Please check the appropriate box)

(1 = Strongly disagree, 5 = Strongly agree)

Question

1. After the activity, I better understood the basic parts of the nervous system.
2. The "Don't put your hand on a hot surface" example helped me understand the flow of information in the nervous system.
3. I learned about the brain's responses to traumatic events.
4. I collaborated well with my groupmates during the activity.
5. This activity created a sense of safety in the classroom.

2. Open-Ended Questions

Learning about the function of which part of the nervous system surprised you the most? Why?

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What benefits can knowing your brain's reactions to a traumatic event have in your daily life?

.....

Which part of this activity did you like best? Why?

.....

What could be added to make the activity more useful?

.....

### **Teacher Activity Evaluation Form**

1. Closed-Ended Questions (1 = Very poor, 5 = Very good)

Question

1. Students were able to correctly identify the parts of the nervous system.
2. Students actively participated in the group work process.
3. Students correctly portrayed the "stimulus-response" relationship.
4. Students understood the explanations about trauma and brain reactions.
5. The activity helped students develop empathy and awareness of safe environments.

2. Open-Ended Questions

What part of the activity did students find most challenging?

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What methods or materials facilitated students' learning?

.....

What changes would you make if you did the activity again?

.....

### **ADDITIONAL SUGGESTIONS:**

Students can benefit from visuals like these that will explain the brain's working principles and its relationship with trauma:

1

1. Traffic Light Model: Red (fight/flight), Yellow (alert), Green (feeling safe) – to depict states of the nervous system.



2

- **Brain Cartoons:** Short cartoons depicting dialogue between the emotional brain (amygdala) and the thinking brain (prefrontal cortex). Students can also create these cartoons themselves. By simply bringing pictures of the amygdala and prefrontal cortex to class, explaining their functions, and then asking students to create cartoons featuring these brain structures for different scenarios.