

LESSON II-7: The Nervous System

Student Learning Objectives:

II-13. Students will name three major parts of the nervous system.

II-14. Students will describe the major function of the nervous system.

Preparation

- Gather needed materials.
- Decide which vocabulary words the students will learn and write them on a large piece of chart paper or flash cards.
- Check your materials to see which media is available for your use.

Materials

Equipment

- VCR and monitor (Optional, depending on media used)
- Cassette player (Optional, depending on media used)
- Filmstrip projector (Optional, depending on media used)

Resources

- Torso or Magnetic Way
- Bulletin Board: "Human Body Systems"
- Video: *Our Wonderful Body: How Its Parts Work Together* (10 minutes) -OR- Filmstrip and Cassette: *The Nervous System* (7 1/2 minutes)
- Teacher Reference: Nervous System Terminology
- Knee hammer

Realia

- 12-inch rulers, one per pair of students
- Vocabulary chart or word cards
- Writing paper
- Pencils

Time: 30 minutes

Lesson Procedure

Introduction: 2 minutes

Connect this lesson on the nervous system to the previous lessons on other body systems.

1. Share with the students:

We have talked about several of our body systems, but how do our systems know what to do? Let's do an experiment. I'd like you to all line up—now!

Pause and allow the students to react, but don't give them any directions. After a brief moment of confusion, give a signal for silence.

I noticed a lot of wandering. Did you know where to begin the line? Did you know who was the leader and who was last? It is difficult to do a good job unless there is some clear direction or leadership.

Today we will learn about the system that directs and controls the rest of the body—the nervous system.

Activity 1: 5 minutes

Describe the different parts of the nervous system and their functions.

1. State:

Let's review some vocabulary words that are used with the nervous system.

2. Write the vocabulary list on a wall chart or word cards. Go over the starred vocabulary words (see the Teacher Reference for definitions and pronunciations). Save the remainder of the words for after the filmstrip.

| | | |
|---------------------|-------------------|------------------|
| * brain | five senses | sensory nerves |
| * spinal cord | motor actions | motor nerves |
| * nerves | reflex actions | autonomic nerves |
| involuntary actions | voluntary actions | |

* = Word to emphasize

3. Point out location of each body part on the poster and torso or Magnetic Way pieces. Provide a brief explanation of each.

Activity 2: 12 minutes

Teacher's Note: Check your materials to see which media is available for use. Use the filmstrip and cassette, *The Nervous System* or the video, *Our Wonderful Body: How Its Parts Work Together*.

Explain the role of nerves in the nervous system.

1. Share with the students:

An important part of our nervous system is our nerves. Let's watch a filmstrip (or video) and learn how nerves work.

2. Show the video *How Its Parts Work Together (Our Wonderful Body Series)* or the filmstrip *The Nervous System*.
3. Discuss the video or filmstrip using the following question and information:

How do we get information about the world around us? [through the five senses: seeing, hearing, tasting, smelling, and touching]

Our sense organs (eyes, ears, nose, mouth, and skin) are connected to our brain by nerves which carry messages from the sense organs to the brain. These nerves are called sensory nerves.

When the brain gets the messages, it decides what the body should do. Another set of nerves takes a message from the brain to the muscles of the body and tells the body to move. These nerves are called motor nerves.

A third kind of nerves are the ones that carry messages from the brain to the internal organs, such as the heart and lungs. They keep our organs working even when we sleep, so we don't have to think about making our heart beat or our lungs breathe. These nerves are called autonomic nerves.

Activity 3: 10 minutes

Identify the difference between voluntary and involuntary actions.

1. Demonstrate reflex or involuntary actions.

Without any warning, drop a book to make a loud noise. Students should automatically demonstrate the reflex action by jumping back or blinking their eyes.

What did you notice yourself doing as I dropped this book? [jump, blink]

These fast reactions were the work of the nervous system, the body's control center. In less than a second, the nerve cells were working, sending signals to all parts of the body without us having to think about it.

Ask for a volunteer to come to the front of the room and sit in a chair so that his/her legs are bent, but not touching the ground.

Watch what happens to our volunteer's knee.

Demonstrate the knee reflex using a knee hammer or the edge of your hand.

This reaction is another example of the work of our nervous system. The leg moves without us thinking about it. We call these movements "involuntary actions," because we don't think and decide to respond by moving our leg or blinking. It just happens—thanks to our nervous system.

2. Share with the students:

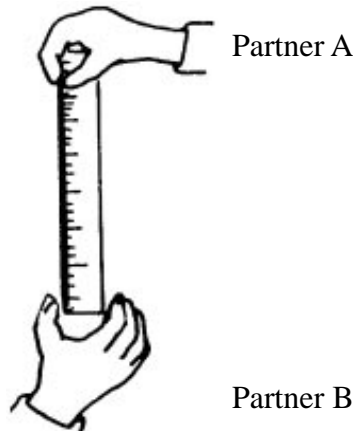
There is another kind of action called "voluntary action." This action is also possible because of the work of our nervous system. Let's see how it works.

3. Demonstrate voluntary actions.

If you want the students to record their "reaction times," have them take out paper and a pencil. Divide the class into pairs. Ask the student with the longest hair in each pair to raise his/her hand. This student will be Partner A. Give a 12-inch ruler to Partner A of each pair. Partners face each other.

Partner A grasps the 12-inch end of the ruler between the thumb and forefinger of one hand with the one inch end pointing toward the floor and with his/her arm extended forward.

Partner B extends one hand toward Partner A with the thumb and forefinger about two inches apart, just below the one inch end of the ruler.



Partner A is instructed to release the ruler, and partner B is instructed to close the thumb and forefinger on the ruler just as soon as he/she sees that it has been released by Partner A. Instruct students they are not to anticipate the release.

Conduct several trials and instruct Partner B to record or remember the number on the ruler at the place he/she caught it each time. The numbers represent a rough approximation of reaction time in hundredths of seconds.

Have the students change roles and repeat the activity, again recording the measurements.

4. State:

This is an example of “voluntary action,” because it was necessary for you to consciously think about moving your fingers to catch the ruler. Over several trials, your response time should shorten, showing that voluntary actions improve with practice.

Closure: 1 minute

- Summarize by asking:

Who remembers one kind of nerve we have in our nervous system? [sensory, motor, autonomic]

These nerves help our nervous system do its job. Who can tell us what the nervous system’s job is? [directs and controls the rest of the body]

Later on in our health lessons, we will learn how harmful illegal drugs are to our nervous system. This is why it is important to do the right thing and say “no” to illegal drugs.

- State:

Our next health lesson will help us review some of the things we have learned about our body systems.

Integration Ideas

Math

- Use the results of the ruler experiment in Activity 3 to practice graphing. Graph individual results to see if reaction times improved with practice. Graph class results to see the range of reaction times and the most common reaction time.
- Use the results of the ruler experiment in Activity 3 to practice finding averages.

NERVOUS SYSTEM TERMINOLOGYTeacher Vocabulary

1. Brain: the organ that interprets messages from the sensory nerves and sends commands via motor nerves.
2. Spinal Cord: nervous tissue extending from the brain down through the center of the vertebrae of the spinal column.
3. Nerves: conduct impulses between the brain and spinal cord and all the body parts.
4. Five senses: perception of stimuli to hear, see, smell, taste, and touch.
5. Motor action: movements that are controlled by nerve impulses to the muscles.
6. Reflex actions: quick, automatic, and involuntary movements which are triggered by impulses from sensory nerves to the spinal cord and then back to the muscles, usually in order to protect us.
7. Involuntary actions: muscular movement that occurs without our conscious control.
8. Voluntary actions: muscular movement that occurs when we consciously think about moving.
9. Sensory nerves: those nerves that carry messages from the sense organs (eyes, ears, nose, mouth, and skin) to the brain.
10. Motor nerves: those nerves that carry messages from the brain to the muscles.
11. Autonomic [aw"to-nom'-ik] nerves: those nerves that control the internal organs that work all the time.