

Science Lesson Plan

The Nervous System

I. Main Ideas/Conceptual Understanding/Goals

LIFE SCIENCE 3. Describe the characteristics, structures, life cycles, and environments of organisms.

Identify and describe the purpose of the digestive, **nervous**, skeletal, and muscular systems of the body. (DOK 1)

II. Specific Objectives/Lesson Focus

1. The student will identify the purpose of the nervous system of the body.
2. The student will identify the major components of the nervous system and summarize the functions.

III. Procedures

A. Introduction/Motivation

1. Have the room arranged with the following materials on a table.
 - Index cards
 - Pencils
 - Granola bars
 - The "Nervous Man" Handout (**attached**)
 - Data Recording Sheet (**attached**)
 - Pillow
 - Yardsticks/Meter Sticks
 - Modeling Clay (**optional**)
2. Discuss the following information about the Nervous System.
 - The nervous system is the most important system in the human body.

- The nervous system is the control center of the body, monitoring conditions within and outside the body and sending out electrical signals to respond to them.
- The nervous system is divided into two systems: the Central Nervous System and the Peripheral Nervous System.
- Say... "Today we are going to continue learning about the Human Nervous System."

B. Study Learning

- Give students one or two index cards and let them write one or two interesting facts they learned about the Human Nervous System or the Brain from the previous lesson.
- Allow time to discuss some of the interesting facts the students recorded that they learned.
- Correct any misunderstanding that you hear or see.
- Review these fun facts about the Nervous System.
 - Your **central nervous system** includes your brain and your spinal cord.
 - Your spinal cord is a long bundle of neurons that goes down your back.
 - From the spinal cord, nerves stretch throughout your body like a highway. This is the **peripheral nervous system**.
- Explain to the class that the brain connects to every part of our body.
- Give students a copy of the handout, "Nerve Man" (**attached**).
 - Discuss with the students that the brain and spinal cord are the "control centers" of our body.
 - Let the students point to their brain and spinal cord.
 - Explain that it is through the spinal cord that messages are sent to many areas of the body, but before the spinal cord can send the messages, it must receive its directions from the brain.
 - Point this out on the handout, "Nerve Man" (**attached**).
 - Explain that the nerves located in your brain and the spinal cord are called the central nervous system.
 - Our peripheral nervous system contains the nerves going out to all parts of our bodies.
 - Explain that every part of your body depends on directions from your brain to tell it what or how to do something. Your nerves are what carry these messages from the brain to all parts of your body.

Each nerve passes the message to another nerve, etc., etc., until the message reaches its destination. The process takes time to complete.

- Ask the following question
 - How fast do you think messages travel in the human nervous system? (Answer: about 200 mph; similar to the speed of a race car).
- We are now going to do an activity called the “**Granola Bar Challenge**” to show that it takes time for messages to travel throughout the body.
 - To play the game the student must catch the falling Granola bar between their hands.
 - Choose one volunteer who thinks they can catch the Granola bar.
 - Have the volunteer stand with his/her hands waist apart, bent at a 90-degree angle at stomach height.
 - Remind the student that his/her hands must not move up or down once in position.
 - Hands may only move together (like you are clapping) to catch the Granola bar, once the bar is dropped.
 - The Granola bar must be caught at waist height (they can't catch it right before it hits the floor, down on their knees).
 - Put a pillow or something soft that will cushion the Granola bar if they should miss, so that it doesn't break.
 - The teacher should hold the Granola bar about a foot in front of the bottom of the child's chin, so that the Granola bar may fall straight through their hands when they clap them.
 - Drop the Granola bar without warning and see whether he/she can do it.
 - **Note to Teacher:** Students may not be able to do it on the first try. If they can't catch it then their nervous systems may not be fully developed yet. For older children, you may have to lower the initial height of the Granola bar to make it more challenging.
- If the student catches the Granola bar:
 - Explain that the nerves that connect the brain to the spinal cord and the Peripheral Nervous system are well developed and therefore conducted the message quickly.
- If the student does not catch the Granola bar:
 - Explain that the message sent from the nerves that connect the brain to the spinal cord and the Peripheral Nervous system did

not travel fast enough for his/her hands to grab the Granola bar. As his/her nervous system becomes more developed, over the next few years, this task may not be difficult.

- Have students get into groups with four students in each group.
 - Have the students choose a name for their group.
 - The students should choose one student to be the data recorder, one to be the “catcher”, one to be the “dropper”, and one to be the observer.
 - Rotate roles after each student’s three trials.
- Pass out one yardstick/meter stick to each group along with the “Data Recording Sheet” (**attached**).
 - Have students follow the same directions as the directions given earlier in the lesson using the Granola bar.
- When the student catches the yardstick/meter stick have him/her keep his/her hands in that position until the observer tells the data recorder the number on the yardstick/meter stick that is just below the “catcher’s” baby fingers. This number will be recorded (in inches or centimeters) as the “catcher’s” catching distance.
- When all the students in a group have had a turn to be the “catcher”, have the group work together to find each student’s average.
- **Note to teacher:** For younger children you may want to just let the students practice catching the yardstick/meter stick or granola bar instead of finding averages. You could see who could catch it 3 out of 3; or 2 out of 3; or 1 out of 3.

3. Culmination

- Discuss the results from the group activity above with the class
- Be sure to emphasize the fact that everything we do is connected and regulated by the brain and takes time for processing
- Ask are there any questions and clear up any misunderstanding.
- Students who have access to computers or iPads can summarize what they learned today or to do further research on the nervous system.

4. Follow-up

- Have students practice this eye/hand activity at home with a parent for a week and see if they can improve their averages or there odds for catching it the first time.
- Have students analyze their results from the eye/hand activity with the results they get after one week of practice.
- You can use the "Data Recording Sheet" for the group activity as an assessment.

Extensions and Connections (Assign as needed)

- Students can compare their eye/hand activity results from today's activity with that of a partner.
- Students can make a model brain using modeling clay.
- Have students draw and label the nervous system to include both the Central Nervous System and the Peripheral Nervous System.
- Allow time for the students to compare their drawings to a partner in class. Let students discuss what they learned while doing the activity.

Ideas for Journal/Writing Prompts

- Write a paragraph explaining how the Peripheral Nervous System works.
- List three to five things that you learned about the Peripheral Nervous System, and tell why those things are important to know.
- Write a paragraph describing today's eye/hand activity.