

### Summary Description

This is the seventh in a series of 8 lessons that introduces the student to human anatomy.

### Learning Objectives

To have the student learn a few key facts about the nervous system.

### Approximate Time for Lesson

30 minutes

### Suggested Maturity Level for Instruction

Student should be able to read simple words and perform simple addition and subtraction. Also, student should be able to sit still and engage in one-on-one conversation.

### References:

Your Brain & Nervous System, KidsHealth -

[http://kidshealth.org/kid/cancer\\_center/HTBW/brain.html](http://kidshealth.org/kid/cancer_center/HTBW/brain.html)

### Materials Needed

1. Internet Access - Pull up the following:

- a. Picture of the nervous system (go to <http://www.theukstress-reductionconsultancy.co.uk/Portals/67/images/nervous-system.gif>)
- b. Picture of the brain (go to [http://www.medem.com/medem/images/ama/ama\\_brain\\_overview\\_lev20\\_thebrainsideview\\_01.gif](http://www.medem.com/medem/images/ama/ama_brain_overview_lev20_thebrainsideview_01.gif))
- c. Video of the nervous system (go to <http://www.youtube.com/watch?v=z6t9Yss45VI>)

### Preparation

Make sure you have materials open, printed and/or available prior to beginning the lesson.

### Script

#### Introduction (5 minutes)

1. Teacher: Alright. So last lesson we learned about the urinary system. Can you tell me some of the important body parts of the urinary system? [Engage the Student in conversation but come to the point that any of the following are parts of the urinary system: 1) kidney, 2) ureter, 3) bladder, and 4) urethra]
2. Teacher: Now, we're going to learn about only 2 parts of your body that helps you react to your surroundings. The combination of these 2 organs is called the nervous system, which makes you laugh if you think something is funny or cry if you think something is sad. Can you say "nervous system"? [Have the Student repeat the word "nervous system" several times]
3. Teacher: Great, so are you ready to learn about the nervous system? [Get positive response from Student and begin lesson]

Lesson (20 minutes)

1. Teacher: Great. Now like I said before the nervous system helps you sense things around you. And you actually have 5 senses that help you react to your surroundings; can you guess what they are? I'll give you a hint, one of those 5 senses you have is the sense of sight, or ability to see things with you eyes. What are other senses that you have? [Engage the Student in conversation but come to the point that the other 4 senses are: 1) hearing, 2) smell, 3) taste, and 4) touch]
2. Teacher: Good. Now, you see with your eyes, hear with your ears, smell with your nose, taste with your tongue, and touch (and feel) with your hands and entire body. But did you know that even with you eyes, ears, nose, tongue, and hands, that you still could not sense anything without one important organ? [Get Student's negative response and move on]
3. Teacher: That's right - that organ is called the brain. Without it, even though you see something bright with your eyes, you still would not know close your eyes or if there's something really loud, to put your hands over your ears. You see, your brain helps makes sense of everything that goes on around you. But even more than just sensing stuff outside your body, it also acts as headquarters to your internal body. And like it or not, your brain automatically controls things that even you cannot control, like the beating of you heart or breathing when you're asleep. You don't tell your heart to beat or lungs to breathe, your brain does that for you. Here's a picture of one side of a brain [Show the Student the picture of a brain]
4. Teacher: Your eyes would be here [point to the approximate location of the eyes in relation to the picture of the brain] on the left side. Now, look at all the different parts of the brain. I'm not going to explain each one, but there are some important parts I want to talk about.
5. Teacher: See this pink part that makes up the most of the brain? [point to the cerebrum] This is called the cerebrum (pronounced "sir-ee-brum"). The cerebrum is the part that controls your voluntary muscles. So if you want to move your left arm all the way up, your brain sends a signal, just like a message through the telephone, to the muscles in your left arm. Then, your muscles in your left arm pull up and that's how you can lift your left arm over your head. And it's the same with every part of your body that you can control yourself. The cerebrum is known as the thinking part of your brain because you need it to solve problems, like math or even play video games.
6. Teacher: Now, this light yellow part near the bottom of the brain is called the cerebellum [point to the cerebellum]. The cerebellum helps your body keep in balance. For example, your cerebrum will control the muscles of your legs and feet to make you stand up. But your cerebellum will help you balance on your legs once you're standing. In the same way, your cerebellum will keep you from falling down if you're walking down some stairs or playing on the playground.

7. Teacher: Next is the brain stem, the green part at the bottom of the brain [[point to the brain stem](#)]. The brain stem controls all the involuntary muscles in your body. The brain stem controls things like blood movement, heart beat, breathing, and digesting food. But the brain stem is also very important in that it connects the brain to the second organ that has to do with the nervous system - the spinal cord. In fact, let me show you the entire nervous system. [[Show the Student the picture of the nervous system](#)]
8. Teacher: This long looking blue piece that connects to the brain stem is called the spinal cord. [[Point to the spinal cord](#)] The spinal cord is actually located inside the hollow part of your backbone for protection. The spinal cord is really a bundle of nerves made up of special cells called neurons which are in charge of sensing and sending messages to your brain.
9. Teacher: And this is how it works. Let's say that a bowling ball fell on your toes. Well, the neurons in your spinal cord that are in charge of sensing feeling in your toes will quickly send a message to your brain telling it that your toes are hurting. Your cerebrum will then send a message back to your body to say "ouch!" and start hopping on one leg while holding the foot that got hurt with your hands. Since you are hopping around, your cerebellum will help you balance on one leg while hopping. And finally, your brain stem will send a message to your heart to beat faster and to your lungs to breathe faster since you are moving around and, therefore, need more air. So if a bowling ball ever lands on your foot, at least you'll be safe knowing that your cerebrum, cerebellum, and brain stem are doing their job right!
10. Teacher: Now, let's talk about one last thing before the end of this lesson. As you know, there are many senses and involuntary things that your body does. Well, how do your neurons decide which will be the messengers for say, sensing feeling in your toes, while others will be the messengers for say, the beating of your heart? Well, the decision of which neuron does what depends on where the neuron is along the spinal cord.
11. Teacher: You see, there are special spots, like parking spaces at your shopping mall, that are meant for neurons to sense a specific thing about the body. Depending on where the neuron is "parked" in the spinal cord, makes that neuron responsible for that one specific thing. Let's look at the nervous system picture again. [[Show the Student the picture of the nervous system](#)]
12. Teacher: Each of those spots up and down the spinal cord is reserved for the neurons to sense something specific about the body. For example, that upper spot on the spinal cord [[point to the spot on the spinal cord that slows the heartbeat](#)] is responsible for slowing down the heartbeat. The neurons located right here send messages to the brain to slow down the heartbeat when, say, you are sleeping (since you need less air when you sleep). Also, this spot here [[point to the spot on the spinal cord that accelerates the heartbeat](#)] is responsible for making the heart beat faster. The neurons located here send messages to the brain to make the heart beat faster when, say, you are running (since you need more air when you run).

13. Teacher: By the way, if you were wondering, this yellow cord that runs along the blue spinal cord is still part of the spinal cord. The illustrator just wanted to show you that there are many locations on the spinal cord that is responsible for sensing things in your body. Ok, now that we learned a bit about the nervous system, here's a short video that you can watch that will help you understand what we learned today. [\[Show the Student the video of the nervous system\]](#)
  
14. Teacher: OK - time for review. Go stand up and get in front of the class (consider inviting other members of the family also to set the stage). [\[Ask Student the following:](#)
  - a. What is the part of the nervous system that controls your body? Brain
  - b. What is the part of the nervous system that is connected to you brain that helps sense things in and around your body? Spinal cord
  - c. What are the special cells called that sense everything in and around your body? Neurons
  - d. What is the largest part of the brain called? Cerebrum - it controls the voluntary muscles of your body
  - e. What is the part of the brain called that helps keep your balance? Cerebellum
  - f. What is the part of the brain called that controls your heart beat? Brain stem

Teacher reviews any questions that the Student missed].

Wrap Up (5 minutes)

Teacher: [\[Clapping\]](#) You did GREAT! Wonderful job! Are there any questions that you have regarding the nervous system? [\[Engage in conversation with the Student and follow up with questions you cannot answer by researching the Internet\]](#)