The Brain and Spinal Cord

By Jennifer Kenny

[1] Your body's nervous system has many important jobs. It can also be divided into three categories. The **central nervous system**, or CNS, is made up of the brain and spinal cord. It is the center of your body and the center of control and coordination. The **peripheral nervous system**, or PNS, includes the nerves that reach the outer parts of your body. Finally, the **autonomic nervous system**, or ANS, includes the nerves that are near the center part of your body. The ANS is actually a smaller part of the PNS, which controls the automatic processes.

[2] Now, the brain takes up the top half of the inside of the head. The brain is protected by the skull or **cranium**. The skull bones have holes to let nerves join the brain. These are the cranial nerves. There are twelve of them and different ones branch to different places – such as to the head, to the face, to the neck, and to the chest/abdomen. Many blood vessels run through the brain to give it oxygen, water, and dissolved food as well.

[3] The **brain** is a grayish, jellylike organ. It is slightly larger than a grapefruit in size. It looks like a huge walnut with many grooves and folds. There are many parts to the brain.

[4] The **cerebrum** makes up 85 to 90% of the brain. The cerebrum holds the centers for sight, sound, taste, smell, and touch. It is the center for thinking and memory, decision-making, and controls for muscles. The wrinkled part of the cerebrum is the **cerebral cortex**. It is made of between 10 to 14 billion neurons! The cerebrum and the cortex are divided into the right hemisphere and the left hemisphere. Each controls muscles on the opposite side of the body. The left side of the cerebrum controls your ability to read, speak, and do math. The right side of the cerebrum controls your abilities in music, art, and understanding of shape and form.

[5] Between the two halves of the cerebrum, you can find the **thalamus**. Thalamus means "inner room." It is the brain's main relay station. The **hypothalamus** means "under the inner room." It is the control center for many functions and emotions. It helps keep your body temperature at 98.6 degrees Fahrenheit.

[6] There is also a **brain stem**. It has four tiny **colliculi** to control eye muscles and adjust your ears to sound. Therefore, you will flinch at a loud noise or blink when something comes near your eyes.

[7] The **medulla oblongata** blends into the spinal cord. It is only one inch long, but it is responsible for involuntary actions in your body such as your heartbeat, breathing, and digestion.

[8] Finally, the **cerebellum** is the part of the brain that means "little brain." It takes care of movements in your body and balance. It allows you to hold a fork, run, or pitch.

[9] The average adult has a brain that weighs around three pounds. The brain continues to grow in size until a child turns around seven years old.

[10] The biggest nerve joining the brain is actually the spinal cord. In fact, the spinal cord is more like an extension of the brain. It actually passes through the large hole in the skull base and along a tunnel formed by the holes inside the backbone. Thirty-three separate bones of the spine help protect the spinal cord from injury. In an adult, the spinal cord is about eighteen inches long.

[11] The spinal cord is the brain's main link to the rest of the body. The outside of the spinal cord looks white and contains the nerve fibers that deliver signals to and from the brain. The inside of the spinal cord contains the concentration of gray matter – cell bodies of motor neurons that carry signals to muscles. Thirty-one pairs of spinal nerves branch outward into the body. They keep branching into smaller branches. Each spinal nerve actually contains thousands of sensory and motor neurons. Except for a few nerves in the head, all the other nerves in the body lead to the spinal cord first. If any of these spinal nerves were injured, a person might be paralyzed because the messages would be cut off. The spinal cord takes care of many reflexes that occur automatically, without thought, when messages are received by the sense organs.

[12] The nervous system is such a vital part of your body. Certainly, the spinal cord is very important to your ability to function. That's true of the brain as well and, of course, your brain makes you, you!

Name _____ Science Pd: _____

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1. The central nervous system includes the brain and spinal cord. (A) False (B) True	2. Another word for skull is _____. (A) Jawbone (B) Vertebrae (C) Cranium (D) Cartilage
3. The brain, in an adult, is about the size of a _____. (A) Grape (B) Pea (C) Plum (D) Grapefruit	4. Which part of the brain would help you remember a story? (A) Cerebellum (B) Cerebrum (C) Medulla oblongata
5. Which part of the brain would help you hold a glass of water? (A) Medulla oblongata (B) Cerebellum (C) Cerebrum	6. The size of your brain continues to grow your entire life. (A) False (B) True
7. In an adult, the spinal cord is about _____ long. (A) 6 inches (B) 36 inches (C) 28 inches (D) 18 inches	8. Why could a spinal injury leave someone paralyzed? _____ _____