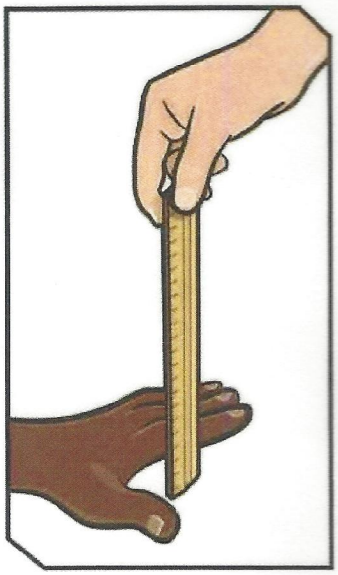
REFLEXES AND REACTION TIME 6

Materials:

- **Science Log Sheet**
- *Ruler*

Procedure:

1. Read the information about the nervous system on the back of this card.
2. Copy the charts below on your Science Log Sheet.
3. Take turns performing the reflex tests listed on the chart with a partner.
   - For Test 1, look at your partner's eyes and notice the size of the pupils. Have your partner close his or her eyes for about 10 seconds and then open them wide. Observe the change in the size of the pupils.
   - For Test 2, clap your hands right in front of your partner's face.
   - For Test 3, have your partner sit on a high stool so that his or her legs are dangling. Use the side of your hand to tap your partner's leg just below the knee.
4. For each test, record what happens.
5. Then, test your partner's reaction time. One partner will be the dropper and one partner will be the catcher. The dropper will hold a ruler at the top (by the highest number). The catcher will hold his or her hand 1" below the ruler, with the thumb and fingers open and ready to catch the ruler by pinching it. Without warning, the dropper will drop the ruler, and the catcher will try to catch the ruler. The catcher will hold the ruler where it was caught.
6. Record the place where the ruler was caught on the Reaction Time chart (example: 3" mark).
7. Repeat this experiment eight times. Record where the ruler is caught each time.



Observations/Results:

Reflexes

Test	What happened?
1. Close eye 10 sec. then open	
2. Clap hands in front of partner's face	
3. Tap your partner's leg	

Reaction Time

Trial	Where ruler was caught
1	
2	
3	
4	
5	
6	
7	
8	

CONCLUSIONS

Answer the following questions about what you've observed during the experiment:

1. **Explain what happened during each reflex test. Why do you think it happened?**
2. **Did your partner's reaction time improve the more times you did the experiment? Why do you think that happened?**
3. **Do you think reaction time is important to a baseball player? Why or why not?**

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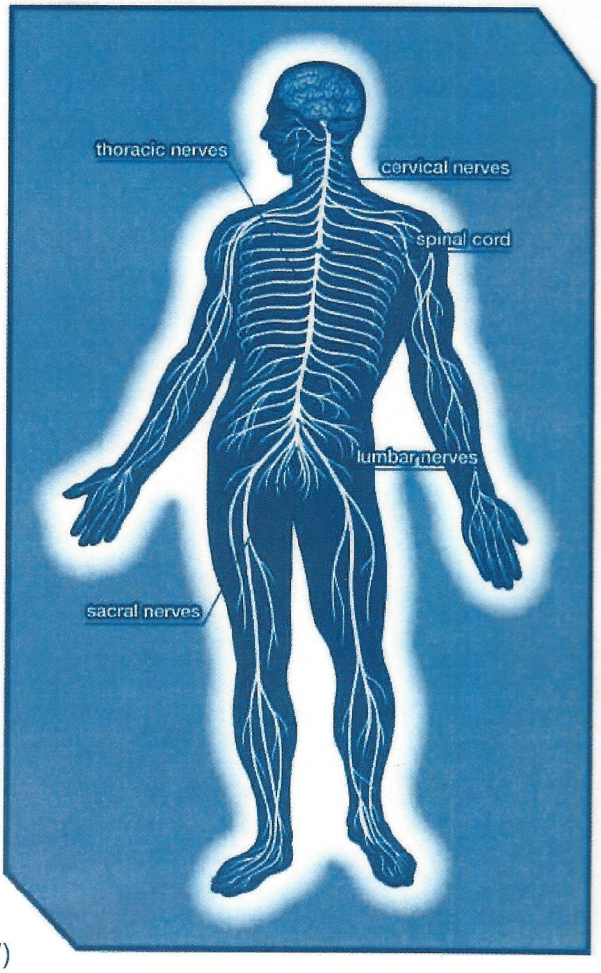
The **nervous system** is the control center of the body. Made up of the brain, spinal cord, and nerves, the nervous system processes information from the body and controls how the body reacts and moves. It controls everything you do from walking and breathing to reacting to stress. It controls your learning and thinking, and how you smell, see, and taste food. It does this through millions of nerves that are located all over the body.



The brain is made up of billions of nerve sensors called **neurons**. These neurons process the information that the nerves in the body send. The brain is connected to the **spinal cord**. The spinal cord is a bundle of nerve tissue. The nerves branch out from the spinal cord to the entire body and carry messages to and from the brain. Nerves tell your brain that something is hot or cold or painful. The neurons in the brain then send a message back to the body, telling it how to react to the heat or cold or pain. There are more than 100 billion neurons in your brain that are constantly receiving messages from your body!

Sometimes your body reacts to something before your brain even knows about it! For example, if you accidentally place your hand on a hot stove, the message from the nerves in your fingertips ("This is hot!") zooms to your spinal cord, which instantly sends back instructions to the muscles ("Move away!"). By the time your brain becomes aware of the danger, your hand is already safe. These automatic reactions are called reflexes, and they protect you from many dangers. The time between the stimulus (feeling the heat) and the response (moving your hand) is called the reaction time. Because the nerve messages take a shortcut to the spinal cord and back without going all the way to the brain, the reaction time for a reflex is very fast. Reaction times for actions that involve the brain, such as playing a video game, are longer.

Extension Activity:

- **Test a partner's reflexes by throwing a cotton ball at him or her. Did the person blink? See if you blink when a cotton ball is thrown at you. Why does this happen?**