Lesson 9.3

## **Neuron Exploration**

Name

Date

**Period** 

Key Terms				
sensory Neuron	motor Neuron	interneuron	nerve impulse	



- 1. Consider the sense of touch. How do you think it works?
- 2. How fast can the body respond to a stimulus like touch?
- 3. How many kinds of touch can the body recognize?
- 4. Is there a difference in sensitivity of different areas of skin on a person?
- 5. Give an example of an area with high sensitivity and an area of low sensitivity.



As your teacher lectures on the nervous system, answer the questions below.

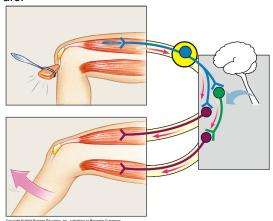
6. Draw a picture of a neuron the space below. Indicate where the <u>cell body, nucleus, dendrites, axon, and myelin sheath</u> are.

- 7. Describe the function each of the following kinds of neurons.
  - Motor neuron –
  - Sensory neuron –
  - Interneuron –



- 8. Where does a neuron receive a message?
- 9. Describe the flow of an impulse through a neuron.

10. Below is a picture of a knee-jerk reaction. Label (using arrows) where the motor neuron, interneuron, and sensory neuron are





Explore II Nerve Impulse Velocity – Reaction time



In this activity, you will determine the time it takes you to take in sensory information from your eyes, and send a message through your nerves to control the muscles in your forearm and hand.

A lab partner will release a ruler without advanced notice. You will respond to this stimulus by attempting to grasp the ruler before it falls to the floor. The distance it falls can be used to determine the time it takes you to respond to this stimulus.

Complete the data table and calculations below for your own reaction time.

## Data

Trial	Distance Ruler Fell (m)	Average Distance (m)	Reaction Time $t = \sqrt{\frac{2 \cdot \text{distance}}{9.8}}$ (sec)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Name	Time (sec)

Class Data

2	
Explain	I

11. Is nerve impulse propagation instantaneous?

12. Why is everyone's reaction time different?

13. How do you think this data can be applied in situations like driving? Do you think that reaction times should be taken into account when people take their driver's tests?

## Explore III Skin sensitivity

The teacher will model how to use a paper clip to stimulate the skin at two locations simultaneously. You will vary the distance of separation between the stimulus points at various locations on the body. Indicate the minimum separation distance between the points where the points are indistinguishable. So at what point do you feel only ONE. (Make sure your eyes are closed when you are being tested.)

Stimulus Location	Separation Distance (cm) YOUR prediction	Separation Distance (cm) ACTUAL data
Finger	1 OOK prediction	AOTOAL data
i iiigei		
Palm		
Inner Forearm		
Inner Upper Arm		
Cheek		0.06 cm
Shoulder		0.41 cm

2	
Explain	Ш

- 14. Is there a difference in the sensitivity of the skin at various locations on the body?
- 15. List the least sensitive to most sensitive areas from the ACTUAL data. (all six sites)
- 16. Explain using your understanding of the nervous system why some areas are more sensitive than others.
- 17. What adaptive advantages are there for the differences in sensitivity?