Name: _____ Date: _____ Period: ____

Sensory Receptors Week #____

Directions: Read and annotate the passage. Then answer the questions.

Right now, you are aware of your surroundings – you can see what is going on, you can hear people's voices, and you can feel the seat beneath you. The reason we can see, feel, touch, taste, smell, and think is because of the nervous system. It collects information about the body's internal and external environments, processes that information, and responds to it. There are two main parts of the nervous system: the peripheral nervous system and the central nervous system.

Nervous System

1. _____	2. _____
consists of nerves and other cells that collect information about the body's external and internal environment	consists of the brain and spinal cord that process information and create a response delivered to the appropriate part of the body

One way the body collects information about the external environment is through sensory receptors. Sensory receptors are cells that transmit information about a stimulus, or change in the environment. For example, your skin has mechanoreceptors that can feel touch and pressure. These receptors send that information through the spinal cord to the brain to be processed and understood. In addition, your skin has different densities of mechanoreceptors, or different numbers of mechanoreceptors in a given area, based on the function of that area.

3. (RST.9-10.1) What is the function of the nervous system? _____

_____

4. (RST.9-10.1) What part of the nervous system are sensory receptors, like mechanoreceptors?

_____

The Two-Point Discrimination Test reveals the ability of mechanoreceptors to determine if one or two points are touching the skin. If two points are placed in an area of skin that is low in receptor density, then a person might feel only one point. However, if two points are placed in an area that is high in receptor density, then a person might perceive both points. Today, you will conduct the Two-Point Discrimination Test to determine a person's mechanoreceptor density.

Procedure

1. Tell your partner to place one arm on the table, palm facing up.
2. Tell your partner to look away and close his/her eyes.
3. For trial 1, take either 1, 2, or 3 toothpicks, and gently press the side of the end of the toothpick against your partner's fingertip (pointer finger) for 3 seconds. Do not tell your partner how many toothpicks you have. See Figure 1.
4. Ask your partner to say how many toothpicks he/she feels. Record if your partner is correct or incorrect by placing a ✓ or an X in the appropriate place in the data table.
5. Repeat steps 2 – 4 two more times for the other two trials.
6. Repeat steps 2 – 5 for the other parts of the body.
7. Switch with your partner so that you are the test subject.

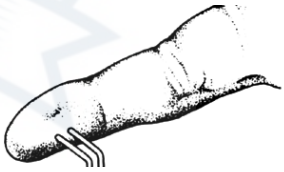

Figure 1

Body Part	Trial		
	1	2	3
Fingertip			
Palm			
Back of hand			
Forearm			
Back of arm			

Name: _____ Date: _____ Period: ____

Directions: Answer the following questions based on results from the Two-Point Discrimination Test.

1. What part of the body was most accurate at perceiving the correct number of toothpicks, and therefore has the highest density of mechanoreceptors? _____
2. Why do you think this part of the body has more mechanoreceptors than other parts of the body?

   _____
3. What part of the body was least accurate at perceiving the correct number of toothpicks, and therefore has the lowest density of mechanoreceptors? _____
4. What other parts of the body would you expect to have a low density of mechanoreceptors?

   _____

Directions: Answer the following questions based on Figure 2.

Sensory Receptor	Responds to	Some Locations
Chemoreceptor	Small molecules	Mouth, nose, blood vessels
Photoreceptor	Light	Eyes
Mechanoreceptor	Touch, pressure, vibrations, stretch	Skin, hair follicles, ears, ligaments, tendons
Thermoreceptor	Temperature changes	Skin
Pain receptor	Injury	Throughout the body

Figure 2

5. What three receptors are found in your skin? _____
6. Explain what sensory receptors in your body are working right now. _____

   _____

   _____
7. Explain what sensory receptors are in the following parts of the digestive system and what they respond to:
   a. Mouth: _____

      _____
   b. Esophagus: _____

      _____
   c. Stomach: _____

      _____
   d. Small intestine: _____

      _____
   e. Large Intestine: _____

      _____
   f. Rectum and anus: _____

      _____