Honors Physiology **Name: _____**
Sensory Receptors of the Skin

Background: Complete the following table with your group members before starting the lab!

Receptor Ending	**Function**	**Location**
Hair Follicle Nerve Ending		
Ruffini Endings		
Krause Corpuscle		
Pacinian Corpuscle		
Meissner Corpuscle		
Free Nerve Endings		
Merkel Cells		

Define Caliper: (how are calipers used in measuring sensitivity of the skin?)

Touch receptors are distributed unevenly across the body. Some regions have dense distribution while others have sparse distribution. ***Two-point discrimination*** *is a simple way to determine densities across various areas of the body…*

Hypothesis: Make an educated guess as to which part of the body you think would be the most sensitive, then number the 8 locations (that you choose to use) in order of sensitivity.

Take turns testing one another following the **procedure** below:

1.) Beginning with calipers (See *How to make a caliper* instructions on the board!) set to a distance of 15mm, and the subject's eyes closed, touch the dorsal (back) side of the subject's hand and ask her/him to report if one or two points are sensed.

2.) Repeat this procedure while reducing the caliper settings until only one stimulus is perceived. While doing so, touch your partner's hand **with only one** caliper tip at random intervals. This will prevent your subject from guessing what stimulus will be applied (also recommended that the subject close their eyes if they can see the caliper being used.

3.) Record the distance at which only one stimulus is perceived (in the table you create). This is known as a **critical point**.

4.) Continue this experiment for the other parts of the body: palm of hand, index fingertip, forearm (non-hairy, ventral surface), upper arm (outer surface), shin, back of neck. Note that some of the more sensitive areas of the body may display a very small critical point. In such instances, **use smaller spacing intervals** when decreasing the spread of the calipers, such as 1mm.

Remember to record **both partners'** data on a table that you create below:

→ **Required Locations:** fingertip, back of hand, palm, forearm, shoulder blade, and back of neck
**You must do at least 8 locations per partner!*

Data:

Discussion Questions:

1. Which part of the body seems to have the least sensitivity? (Was your hypothesis accepted or rejected?)

2. Which part of the body seems to have the most sensitivity? Why do you think that part of the body is the most sensitive?

3. Discuss how two-point discrimination varies with regions of the body.

4. Suggest how two-point discrimination might be an evolutionary adaptation for the body parts you tested.

5. Your skin is designed to help protect you from harm. Describe at least two situations in which your skin helped protect you or was trying to protect you.

6. You've probably noticed that when you sit for a long period you have to shift your weight from one part of your rear to the other. You simply become uncomfortable and must move a bit. Why do you think this happens? Why do sensory cells in that part of your skin indicate too much pressure exists?

7. What do you think people who are paralyzed from the waist down (paraplegics) must do every 20 to 30 minutes, whether they can feel anything or not? Why?