Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

Touch Receptor Density

Background: Although humans rely heavily on the sense of vision to detect and recognize objects, the sense of touch is also very important. Touch can provide information about an object, such as surface texture, that is not easily detectable by vision. Touch experiences are triggered by mechanical disturbance of the skin produced by physical contact with an object. The human skin contains *mechanoreceptors*, or receptors that are sensitive to mechanical pressure or deformation of the skin. However, the concentration of mechanoreceptors within the skin is not uniform. Rather, the highly sensitive areas of skin, such as the lips and fingertips, contain densely packed mechanoreceptors, while insensitive areas, such as the stomach and back, contain lower concentrations of mechanoreceptors. More sensitive areas of the skin also project to a larger proportion of the somatosensory cortex than less sensitive areas. Thus, the area of the brain which receives touch sensations (for example, from the fingertip) is proportional to the actual sensitivity of the skin area. Observe the skin on arms and fingertips without touching it.

Laboratory Safety Precautions: The following symbols represent the precautions that are required for this lab:



and the potential for


Hypothesis: Write a hypothesis about skin sensitivity based on the observation.

_____

_____

_____

_____

Procedure: The foloowing procedure is used to perform this laboratory exercise.

1. Make a "Touch-o-Meter" by inserting two pins into a piece of cardboard at the desired distances so that the tips are even. Label the cardboard appropriately with the distance.
2. Look away while your partner gently touches your forearm with the Touch-o-Meter, making sure both points touch at the same time. How many points can you feel? Record your data below. Then test the other areas listed. Make sure your partner records your data on your sheet and vice versa.
3. Switch places with your partner and repeat the experiment.

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Data: The following data was collected during this investigation

Touch Sensitivity (number of points felt)

Area	1mm	2mm	3mm	4mm	5mm	10mm	15mm	20mm	25mm	30mm
Pad of index finger										
Back of index finger										
Palm of hand										
Back of hand										
Heel of foot										
Arch of foot										
Forearm (lower inside arm)										
Upper arm (outside)										
Forehead (be gentle)										
Other										

Conclusion: Compare your data with other students'. Not all data may agree. What might be some reasons? What variables (factors) affect the outcome of the experiment? What conclusion can you draw about your hypothesis? Write a conclusion here.

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Questions: Answer the following questions in the spaces provided.

1. What is the independent variable?

2. What is the dependent variable?

3. What is the relationship between the two-point threshold and the tested area? Why is this so?

4. Why are some areas more sensitive than others?

5. What is the most sensitive area you tested? The least sensitive? Why do you think this is so?

6. What factors could be introduced to alter your data? What affect would it have?