Sensory Lab and reaction times.

Part 1) Tactile Sensors

Your skin is filled with various sensory receptors. There are receptor cells that detect pressure, pain, heat, and cold. Mechanoreceptors are those that are activated by touch or pressure. Your skin contains several different mechanoreceptors for both light touch and deeper pressure sensations. Thermorecptors in the skin detect heat and cold sensations. Nociceptors in the skin and elsewhere detect pain – due to bruising, tearing, and burning. The number of sensory receptors is not equally spaced across all parts of the body. In the first part of this lab you will explore the relative distance of pressure sensors (mechanoreceptors) on two parts of the body.

One mechanoreceptor site tested will be on the back of the hand and the other site tested will be on the subjects back, near the shoulder blades (scapula).

Materials and Methods

Pairs of students, compass tools, rulers.

Caution: do not touch so hard as to produce sensation in the nociceptors (pain receptors)!

Work in pairs and use the school compass tools and rulers to detect the minimum distance that you can detect two distinct points on the skin. Alternate touching the subject with either one or two compass points – do not tell them which you are using at any time. The subject cannot look at the touched area and should keep their eyes closed during this test. When using two compass points, begin the with the points at least 4 cm distant in each location. Continue randomly touching with one or two points. As you touch with two points, reduce the distance till the subject can only indicate that it is one point. Note the distances they could detect in each area for two points vs. only one.

Distance of Compass points	Could detect as two points? (yes or no) Hand	Back
4 cm	_____	_____
3.5 cm	_____	_____
3.0 cm	_____	_____
2.5 cm	_____	_____
2.0 cm	_____	_____
1.5 cm	_____	_____
1.0 cm	_____	_____

Which location has the greatest numbers of mechanoreceptors? How do you know this?

Part 2. Thermoreceptor Mapping.

Materials and Methods

Metal probes (dull ends, not sharp), ice, two beakers, markers, rulers.

Draw a 3 square centimeter area on the back of the hand and the underside of the forearm (closer to the elbow than the wrist). Divide this square into one centimeter grids. (closer to the elbow than the wrist). Take the probe placed in an ice bath and touch it to the center of each grid, counting 1,000 before removing and making sure that it only lightly touches the skin and remains cold. Indicate on a drawn out replica of the grid how many squares detect the cold. Repeat with a probe placed in hot water (from the sink, not boiled!). Draw out a hot detector grid map on the paper as well. Repeat this procedure for both areas.

Hand grid Cold Hot

Forearm grid Cold Hot

Which area had more heat thermoreceptors and which area had more cold thermoreceptors?

Part 3) Reaction Lab

Materials and Methods

Reaction time rulers, hair dryers, radios, or other annoying object.

Test each students reaction time. You can start with a practice test. Then repeat for four trials and average their reaction time under two conditions. Condition one, under relatively quiet conditions, with no loud annoying sounds. Condition two, with some annoying sound or confusing stimulus near the subject. Condition 3 is while the student has one hand texting *The Fredisburg Address*, or using a calculator if not text device is available and the other hand is used to grasp the reaction timing ruler.

The subject's partner holds the ruler and without stating anything releases the ruler. Subject attempts to close their fingers around the ruler and catch it as soon as possible after release. The distance and reaction time are noted for the catch. Subjects thumb and forefinger should be about an inch separated at the beginning of each trial before the ruler is released.

The following factors effect reaction times: Age (increases till ~ 20, then decreases slowly, faster after 60 or 70), Gender (males tend to be 8% faster), distractions (usually slows reaction times – two current reports indicate a 4x and a 20 x delay in reactions for texting while driving), drugs, fatigue, etc.

Note if the reaction times and average them. Note differences between the two conditions.

Trial # Reaction Times
Quiet Noisy Conditions Texting

Trial #	Quiet, Focused Trials	Music Noise Trials	Texting Trials
1			
2			
3			
4			
Average			

Add 4th variable texting Plus Music

Gender of subject _____

Was reaction time faster or slower for the subject with the distractions? What was the average difference?

What were the average reaction times for males vs. females in the class?

Condition # 1 = Quiet, focused trials

Males _____ Females _____ All _____

Condition # 2 = Loud Music

Males _____ Females _____ All _____

Condition # 3 = Texting

Males _____ Females _____ All _____

Does this support that texting is a hazard while driving?

Part IV. Standing on one foot (in minutes and seconds – limit of 2 minutes) – have a partner record this:

Eyes open

trial 1 _____ trial 2 _____ class average _____

Eyes closed

Trial 1 _____ trial 2 _____ class average _____

To be typed during your texting trials:

The Fredisberg Address

Omg, 4 score n 7 years ago r fathers brought 4th, upon this continent, a new nation, conceived in Liberty, n dedicated to the proposition that all men r created equal. Lol. Now we r engaged n a gr8 civil war, testing whether th@ nation, or any nation so conceived, and so dedicated, can long endure jk. Btw, we are met here on a gr8 battlefield of th@ war. Haha. We have come to dedicate a portion of it as a final resting place for those who here gave their lives that that nation might live. Lolz. It is altogether fitting & proper that we should do this. ;) LMK :)
But n a larger sense we can not dedic8 - we can not consecr8 - we can not hallow this ground. The brave men, living n dead, who struggled, here, have consecrated it far above our poor power to add or detract. Such a n00b.The world will little note,lol, nor long remember, what we say here, but can never forget what they did here. Kk.

Haha. It is for us, the living, rather to be dedicated here to the unfinished work which they have, thus far, so nobly carried on. ROTFL. Its rather for us to be here dedicated to the gr8 task remaining before us – th@ from these honored dead we take incrEased devotion to th@ cause for which they here gAve the last full measure of devotion – th@ we here highly resolve that these dead shall not have died in vain; that this nation shall have a new birth of freedom; n th@ this government of the people, by the people, for the people, shall not perish from the earth. NVM. Gtg, k?