Physics 220 Lab Survey

Please answer all of the following questions about the **Lab** portion of the course.

Instructions: Choose either *Strongly Disagree, Disagree, Neutral, Agree* or *Strongly Agree* for the following 22 statements.

I find it difficult to gather data from the
1. hands-on equipment used in this lab. *Strongly Disagree* O O O O O *Strongly Agree*
2. computer simulations used in lab. *Strongly Disagree* O O O O O *Strongly Agree*

I feel confident using the
3. hands-on equipment used in this lab. *Strongly Disagree* O O O O O *Strongly Agree*
4. computer simulations used in lab. *Strongly Disagree* O O O O O *Strongly Agree*

I enjoyed using the
5. hands-on equipment used in this lab. *Strongly Disagree* O O O O O *Strongly Agree*
6. computer simulations used in lab. *Strongly Disagree* O O O O O *Strongly Agree*

Quite often during lab I would use the _____ to try things beyond what was asked by the lab write up.
7. hands-on equipment used in this lab. *Strongly Disagree* O O O O O *Strongly Agree*
8. computer simulations used in lab. *Strongly Disagree* O O O O O *Strongly Agree*

I learned more about the class material by using the _____ beyond what was asked.
9. hands-on equipment used in this lab. *Strongly Disagree* O O O O O *Strongly Agree*
10. computer simulations used in lab. *Strongly Disagree* O O O O O *Strongly Agree*

11. I find very little value in using the simulations for this lab.

Strongly Disagree O O O O O *Strongly Agree*

12. I find very little value in using the hands-on equipment in this lab.

Strongly Disagree O O O O O *Strongly Agree*

13. After this lab, I have no idea what a practicing physicist does.

Strongly Disagree O O O O O *Strongly Agree*

14. In this lab I learned things that will help me in my future career.

Strongly Disagree O O O O O *Strongly Agree*

15. The labs in this course are timed well with the class material.

Strongly Disagree O O O O O *Strongly Agree*

16. I leave lab with a better understanding of the course material.

Strongly Disagree O O O O O *Strongly Agree*

I was able to visualize the physics while using the
17. hands-on equipment used in this lab.   *Strongly Disagree* O O O O O *Strongly Agree*
18. computer simulations used in lab.   *Strongly Disagree* O O O O O *Strongly Agree*

I feel that I learned about the concepts by *collecting* data with the
19. hands-on equipment used in this lab.   *Strongly Disagree* O O O O O *Strongly Agree*
20. computer simulations used in lab.   *Strongly Disagree* O O O O O *Strongly Agree*

I feel that I learned about the concepts by *working through calculations using* the data collected with the
21. hands-on equipment used in this lab.   *Strongly Disagree* O O O O O *Strongly Agree*
22. computer simulations used in lab.   *Strongly Disagree* O O O O O *Strongly Agree*

Short Response
When is the hands-on equipment most beneficial?

When is a simulation most beneficial?

Please provide any additional thoughts about the **Lab** portion of this course.

Eating and Exercise Activity

Name: _____

Learning Goals - Students will be able to:
- explain which variables affect BMI and which do not (weight, height, body fat, age, gender)
- explain what BMI tells about a person including its limitations.
- describe what a person can do to increase their heart's strength and what affects strain on the heart and how these two measures are different.
- create a diet that allows a person to adjust their weight by 10 lbs while maintaining % body fat.

Open the PhET simulation "Eating and Exercise".
1. Adjust the variables under the figure one at a time to determine which variables affect BMI. Identify whether they are directly related (one goes up, the other goes up) or inversely related (one goes up the other goes down).

Variable	Affect BMI?	Dependence
Age		
Height		
Weight		
Body Fat		
Gender (*Warning:* the sim automatically changes other variables when gender is changed)		

2. What does Wikipedia say it means if BMI (Body Mass Index) is high or low?

3. If you are "starving" what is your BMI?

Test out a diet: *To test a diet in the sim, drag food onto the plate and exercise into the log. Then press play to see how things change as time goes by.*
4. Figure out how to make the figure in the sim starve. What happens to the BMI when you do this?

5. What defines "Starving" in the sim? Is it different for men and women?

6. What would be an example of a person who has a BMI in the "Obese" range but who has a healthy percentage of body fat?

7. Investigate the heart strength and heart strain indicators.◆ This problem takes a lot of experimenting and you will be graded on your specific answer to this question.
    a. How can you get both high?

    b. How about both low?

    c. How about Strength high and strain low?

    d. Strength low and strain high?

8. Why do you think the sim has lifestyle choices (sedentary, active etc…) but also allows you to put in a certain amount of exercise?

9. Decide as a group on a person whom you will experiment on (realistic person).
    Gender: height:
    Weight: percent body fat to start with:
    Lifestyle: Exercise:

b. Determine how many calories you need to feed this person for them to maintain their weight.
Calories:

c. What is their percent body fat after 2 years:

10. In most cases, the person's body fat in the question above changed even though the weight remained stable. Adjust the person's exercise so they maintain the body fat you gave them to start with. What did you have to do to make their body fat stay stable?

11. If a person eats the same amount of calories and exercises the same but changes what they eat do they gain or lose weight?
    a. What happens if you adjust their diet to have the same calories but they eat more protein and less carbs?

    b. What happens if you adjust their diet to have the same calories but nearly all sugar and fat?

12. Create diets in the simulation that match 11a. above and then 11b. above. What happened?

13. Name two things you learned from the sim that you did not already know.