Scientific Writing: An Experiment

Observation: People who do a lot of exercise (fit people) are less tired when they walk up stairs than people who do not exercise often (unfit people).

Question: Why are fit people less tired when they walk up stairs than unfit people?

Hypothesis: A fit person's heart does not need to beat as fast an unfit person's heart during exercise.

Prediction: Immediately after exercise the increase in a fit person's heart rate will be less than an unfit person's heart rate.

(*What is heart rate?* It is the number of times your heart beats per minute)

Experiment:

- Three people will be defined as 'fit people'
- Three people will be defined as 'unfit people'
- We will measure the change in heart rate of each person during exercise

Part 1: Measure Resting Heart Rate

Measure each person's heart rate 3 times, and then calculate their average resting heart rate. Record your results in the table below. Calculate heart rate by counting the number of heart beats for 15 seconds, and then multiply this number by four.

Example:
Heart beats counted in 15 seconds = 13 beats
Therefore, heart rate is 13 x 4 = **52**

Person	Heart Rate 1	Heart Rate 2	Heart Rate 3	AVERAGE HEART RATE
F1				
F2				
F3				
U1				
U2				
U3				

Part 2: Measure Heart Rate during Exercise

Measure the heart rate for each person as they exercise.

- **First**, record their heart rate after they walk up 1 flight of stairs (walk from the 1st floor to the 2nd floor). Then, allow them to slowly walk downstairs and rest for 1 minute.
- **Second**, record their heart rate after they walk up 2 flights of stairs (walk from the 1st floor to the 3rd floor). Then, allow them to slowly walk downstairs and rest for 1 minute.
- **Third**, record their heart rate after they walk up 1 flight of stairs twice (walk from the 1st floor to the 2nd floor twice). Then, allow them to slowly walk downstairs and rest for 1 minute.
- **Lastly**, record their heart rate after they walk up 2 flights of stairs twice (walk from the 1st floor to the 3rd floor twice).

Person	1 Flight of Stairs *(Exercise Level 1)*	2 Flights of Stairs *(Exercise Level 2)*	1 Flight of Stairs (2x) *(Exercise Level 3)*	2 Flights of Stairs (2x) *(Exercise Level 4)*
F1				
F2				
F3				
U1				
U2				
U3				

Part 3: Examine your Results

Calculate the difference in heart rate for each person during each activity. To do this, subtract their exercise heart rate from their resting heart rate.

Example:

Resting Heart rate = **52**
Exercise Level 1 Heart Rate = **55**
Change in Heart Rate = +3

Person	Change in Heart Rate *(Exercise Level 1)*	Change in Heart Rate *(Exercise Level 2)*	Change in Heart Rate *(Exercise Level 3)*	Change in Heart Rate *(Exercise Level 4)*
F1				
F2				
F3				
U1				
U2				
U3				

Part 4: Graph your Results

Make a graph of your data. I recommend that you use Microsoft Excel, but you can also draw your graph by hand – but it must be neat! (not messy writing!) There are many ways to graph data, create a graph that most clearly displays your data. Remember to label your graph clearly.

Part 5: Write about your Experiment

You will now write a short report about your experiment. Use the format that we discussed in class. You must write the following parts of a scientific report:

- Introduction (5 sentences)
- Methods (5-7 sentences)
- Results (5 sentences) + your graph
- Discussion (10 sentences)

Due: December 18th 2013