Name:

Partner:

Physics 11
M. Lam

Power Lab

Block:

Objective
Determine your power output when going up a flight of stairs

Equipment
bathroom scale
meter stick or ruler
stopwatch

Experimental Method
1. Use a bathroom scale to measure your mass. If you wish, you may wear a backpack it to increase your total mass. Record your mass below. **Caution: Do not overfill your backpack. Make sure you are able to remain balanced while moving.**

   Mass: _____

2. Count the number of steps and measure the height of a single step. Calculate the total height.

   Steps: _____

   Height per step: _____

   Total height: _____

3. Climb the stairs as quickly (and safely) as possible while your partner times you. Record the time below.

   Time: _____

Analysis and Discussion

1. Determine the total amount of work done in climbing the stairs.

2. Determine your power output in watts.

3. Assuming 25% efficiency, how many Calories did you burn when climbing the stairs?
   1 Calorie = 4184 J

4. If your power output could be harnessed and the energy converted to electricity, how many 100-watt lightbulbs could you have kept on during your climb?

5. A typical horse can output an average of 1 horsepower over the course of a day and a maximum of 15 horsepower for a short time interval. Express your power output in horsepower. How long do you think you could sustain 1 horsepower?
   1 horsepower = 735.5 W

