

Objective: To calculate power generated by humans. Equipment: stopwatch, stairs, scale

If you have a medical condition that prevents you from climbing stairs, notify your instructor prior to performing the lab.

1. Record your mass in kilograms.
2. Measure the vertical height of the set of stairs out the back door in meters.
3. Climb the stairs safely with a stopwatch, recording your ascent time to the nearest 0.1 second.

Analysis:

1. Determine the work you did against gravity (i.e., vertically) during the climb. \_\_\_\_\_ J
2. Calculate your power in watts (j/s). \_\_\_\_\_ w
3. Convert your power to horsepower (1 hp = 746 watts). \_\_\_\_\_ hp
4. How long would a 60 watt bulb have to burn to produce the energy you used climbing the stairs? \_\_\_\_\_ s
5. Assuming 100% of your energy can be converted to electrical power, and electricity costs \$0.10 for one kilowatt-hour, how high should you climb to make one penny's worth of electricity? Show all work & units. \_\_\_\_\_ m
7. If one food Calorie (equals 1000 chemistry calories) equals 4184 J, how far up could you climb on one cream-filled Oreo cookie containing 50 Calories? Show work \_\_\_\_\_ m