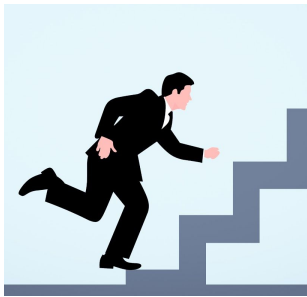


Iona Prep Physics

How much power can you generate running the stairs?

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Power = work/time and work = force*distance

Therefore power = force*distance/time

You will measure the power you generate while running up a flight (or several flights) of stairs. In order to do that you will need to measure three things:

1. Your weight. That would be easy to measure, assuming you have a bathroom scale. Record your weight in pounds. Record your weight exactly like you will be running. For example, if you will be running in your shoes, weigh yourself in your shoes. If you will be running without your shoes, weigh yourself without your shoes. Weight _____ pounds. Use Google to convert pounds to Newtons _____
2. The vertical height of the stairs. The barometer in your phone measures pressure in hectopascals, **hPa**. *If your phone does not have a barometer you will need to measure the vertical height of the stairs using some other method.*

A hectopascal is 100 Pascals = 1 mb.

As you go upwards, atmospheric pressure drops approximately 0.113 hPa per meter for the first 1000 meters.

So here is a way to measure the height of a flight of stairs: you would measure the pressure at the floor level of the lower floor and at the floor of the upper floor. Subtract to find the difference in pressure and divide that by .113 to get the height of the stairs in meters. _____ meters OR use this handy calculator:

<https://ionaphysics.org/HomeLabs/ecalc2.htm>

3. The time (in seconds). Have someone time you. _____ seconds.
4. Finally, calculate your power Power = Force (in Newtons) * Distance (in meters)/ time(in seconds) and will be in Joules/second or Watts. _____ W.
5. Your instructor will tell you how to report the results.