**How Much Power Do You Have?**

It is possible to calculate the power you can output if you can quantify the amount of energy you must expend and have a device to time how long it takes. For our purposes, ascending a flight of stairs will do the trick. Remember to include units in your answers!

1. Measure the height of the stairs. You can’t use a meter stick to measure the entire set of stairs, but you can measure the height of one stair, and then multiply by the number of stairs you have to ascend.

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Note: The width of the stairs are not very important. Sure you expend some energy moving forward, but not that much.

1. Calculate the energy required to go up the stairs. (Remember, mass in this case is YOUR mass.) 1lb=0.453592kg

**Energy = mass \* height of the stairs \* 9.8**

1. Run up the stairs! Have somebody time you and put the values into the table. Calculate your average power!

|  |  |
| --- | --- |
| Energy= | |
| Trial | Time  **Average Power:** |
| **1** |  |
| **2** |  |
| **3** |  |

1. Electrical plugs in North American homes are rated to 120V. Calculate the current a device would need to use the same amount of power that you have.
2. How many seconds would it take a 500W motor to lift you up the stairs?
3. Where do you get your source of energy? What sort of ecological impact do you think your source of energy has?
4. Where would and electric motor get its energy? What sort of ecological impact do you think the electric motor’s source of energy has?

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2 | 3 | 4 |
| Lab not complete, Questions not answered | Lab mostly complete. Questions answered with some errors or incomplete answers | Lab complete. Questions answered correctly and fully. | Lab completed. Questions answered with connections to previous ideas or other topics |