The Power of You!

A top athlete sprinting has a power of about 1700 W and the average person running has a power of about 1000 W. How powerful are you? Are males or females more powerful? When you go up a flight of stairs, you increase your gravitational potential energy. If you start from rest and end from rest, your change in kinetic energy is negligible.

Your Initial Task: You need to figure out your maximum power as you run up the stairs.

You need to hand in:

a)   Method: A brief outline of how you will determine your power. You may include a labelled sketch but you also need to explain in sentence form. Include any formulas you will need to use. Make a good guess as to what your personal maximum power will be.

Knowledge & Understanding	/5
A1.2 Select appropriate instruments and identify appropriate methods for each inquiry.	Full marks – if all is addressed without errors/omissions. Read carefully!

b)   Results: Organize your results so the reader can understand what you did.   You need to include any calculations you did. Make sure your final answer is obvious to reader.   Clearly state your maximum power and comment on how close your personal power estimate was. Which gender was more powerful: male or female? ***Include proper significant digits.**

Inquiry	/5
D2. 3 Use conservation of energy to solve problems in simple situations.	Full marks – if all is addressed without errors/omissions. Read carefully!

c) <u>Analysis</u>: Answer the following questions in proper sentence form.

#1. Two friends do this same activity. How is it that Tom ran up the stairs quicker than Jerry but the both generated the same power? Answer in full sentences please.

#2. A 200 g bag of potato chips contains 4.8 MJ of energy. How long would it take you working at your maximum body power (calculated form this activity) to consume all this energy? Use GRASP to solve this problem.

BONUS: What assumption did you make in this calculation?   Comment on the validity of this assumption.

Application	/5
D2.5 Solve problems involving time, energy and power.	Full marks – if all is addressed without errors/omissions. Read carefully!