How Powerful Am I?

Name:_____ Date:_____

Objective: To determine how much personable power is involved when going up stairs, and to compare maximum power produced and normal power produced

Materials: Bathroom scale, stopwatch, meter stick

Procedure:

1. Measure the height of the flight of stairs in meters. Height = _____
2. For this activity you will need to record your mass in Newtons. Use the procedure as follows.

   Your mass in kg:_____ x 10 = _____ N (newtons).

   (If you only know your mass in pounds, divide your pounds by 2.2 to get kilograms (kg).
3. Run up the stairs as fast as you can while your partner times you with a stopwatch. To find your normal power, go up the stairs at your usual pace while your partner times you. Record the time it takes.

   Fast time: _____(sec) Normal time:_____(sec)
4. Calculate the increase in your body's potential energy by using this formula below. The distance is the height of the stairs between the two floors.

   Energy (J) = Newtons (N) x distance (meters)

   a.)

   b.) Is the energy produced the same for your fast time as your normal time?

5. Calculate the amount of power you produced. (P = E / t)
    a.) Fast time

    b.) Normal time

Discussion:

1. Do you increase your energy more if you climb the stairs quickly than you do if you climb slowly? Explain your answer.

2. Would you produce more power if you climbed the stairs quickly than if you climbed slowly? Explain your answer.

3. An incandescent light bulb produces 60 W of power. Can you produce this much power? Can you produce this much power for 10s. Explain your answers.

4. A typical toaster uses 950 W of power. Is the toaster more powerful than you? Explain your answer.

Conclusion: *(How much power is involved in going up stairs? Explain.)*