

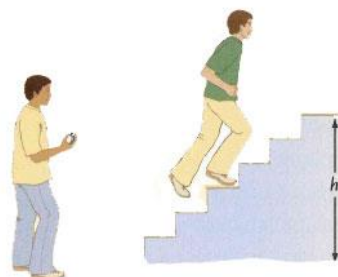
Power Output of a Typical Student

Name: _____ Date: _____

Purpose: to examine which physical characteristics of students affect how much power they can generate when performing an activity such as running up a flight of stairs.

Equipment:

- Metre stick
- Scale to measure the mass of each student
- Stopwatch
- Students* (caution: students who have health problems or are wearing inappropriate or unsafe footwear should not participate in this activity)



Procedure:

1. Use the chart provided on page 2 of this lab
2. Measure the mass of each student (or the weight in Newton's)
3. Measure the height of one step in the flight of stairs that will be used, count the number of stairs and calculate the total vertical height:

$$\frac{\text{height of one stair}}{\text{(\# of stairs)}} \times \text{(\# of stairs)} = \text{total height, } h$$
4. Time each student and record how long it takes for him/her to run from the bottom to the top of the flight of stairs.

Analysis:

1. Calculate the work done and the power for each student and record it in the table.
2. Rank the students starting at 1 (being the most powerful) .

Discussion:

1. Explain how the power output of two students of the same mass could be very different.
2. Explain how the times would compare for a massive person versus a less massive person.