

Quick Lab

DATASHEET FOR IN-TEXT LAB

What is your power output when you climb the stairs?

MATERIALS

- flight of stairs
- meterstick
- stopwatch

Procedure

1. Determine your weight in newtons. If your school has a scale that measures in kilograms, multiply your mass in kilograms by 9.8 m/s^2 to determine your weight in newtons. If your school has a scale that weighs in pounds, you can use the conversion factor of 4.45 N/lb. Record your answers in the data table.

	Weight or mass (lb or kg)	Weight (N)	Time to go up stairs (s)	Stair height (m)	Number of stairs	Total stair height (m)	Work (J)	Power (W)
You								
Your partner								

2. Divide into pairs. Have your partner use the stopwatch to time how long it takes you to walk quickly up the stairs. Record the time in the data table. Then switch roles and repeat.
3. Measure the height of one step in meters. Multiply the number of steps by the height of one step to get the total height of the stairway. Record your answers in the data table.
4. Multiply your weight in newtons by the height of the stairs in meters to get the work you did in joules. Recall the work equation:

$$\text{work} = \text{force} \times \text{distance}$$

5. To get your power in watts, divide the work done in joules by the time in seconds that it took you to climb the stairs.