

Power Output

MATERIALS

For each group

- meterstick
- scale
- stairs
- stopwatch

PROCEDURE

1. Determine your mass in kilograms. Remember $1 \text{ kg} = 2.2 \text{ lbs}$. Show your work.

2. Determine your weight in Newtons. Remember $\text{Weight} = mg$. Show your work.

Record your answers in the data table.

Data Table

	Weight (lb)	Mass (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									

4. With a classmate, use a stopwatch to time how long each of you takes to walk quickly up the stairs. Record your results.

5. Use a meterstick to measure the height of one stair in meters. Multiply by the number of steps to calculate the height of the stairway.

Power Output *continued*

6. Determine the work done to climb the stairs. Remember $W=Fd$. Show your work.

7. Determine your power to climb the stairs. Remember $P=W/t$. Show your work.

ANALYSIS

1. How would your power output change if you walked up the stairs faster?

2. What would your power output be if you climbed the stairs in the same amount of time while carrying a stack of books weighing 20 N?

3. Why did you use your weight as the force in the work equation?
