

Quick Lab

# Power Output

## MATERIALS

For each group

- meterstick
- scale
- stairs
- stopwatch.

## PROCEDURE

1. Use a scale to determine your weight in pounds. Now multiply your weight by 4.5 to convert it to Newtons.

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. With a classmate, use a stopwatch to time how long each of you takes to walk quickly up the stairs. Record your results.
3. Use a meterstick to measure the height of one step in meters. Multiply by the number of steps to calculate the height of the stairway.
4. Multiply your weight in newtons by the height of the stairs in meters to get the work that you did in joules.
5. To express your power in watts, divide the work done in joules by the time in seconds that it took you to climb the stairs.

**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?

---

---

---