LAB NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Work and Power

This lab is designed to help you understand the difference between work and power. To do this you’ll calculate the work required to move your body across a room. After calculating the work required to make it across a room, you’ll make two trips, one slow and one fast, so you can calculate and see the difference in power.

MATERIALS: Meter stick and Stopwatch

PROCEDURE:

1. The equation for work is force times distance. As you will be moving your weight, and weight is a force, we must get your weight in Newtons. To do this, multiply your weight in pounds by 4.448 and enter the information in the data table. This is the force part of force times distance.
2. Next we need to get the distance part of force times distance. Go to the gym and measure the length from one wall to the other. Enter the distance in the distance table.
3. Compute the work to be done by multiplying force times distance (your weight in Newtons X the length of the gym). Enter this value into the data table.
4. Using the stopwatch, record the time it takes you to walk the length of the gym. Enter this time in seconds in the data table.
5. Repeat step 4 but “run the length of the gym” as fast as it is safe to do so. Enter this time in the data table.
6. Compute the power required to walk and run the length of the gym by dividing work by time and enter these values in the data table.
7. Answer the questions following the data table.

|  |  |  |  |
| --- | --- | --- | --- |
| Data Table | | | |
| Your weight in pounds: |  | Your weight in newtons:  (pounds x 4.448) |  |
|  | | Gym length in meters: |  |
| Work in Joules:  (weight in newtons X length) |  |
| Time walking in seconds: |  | Time running in seconds: |  |
| Power in watts:  (work divided by time) |  | Power in watts:  (work divided by time) |  |

**CONCLUDE and APPLY**:

1. Is the work you did walking and running across the gym the same?
2. Why?
3. Which required more power, walking or running across the gym?
4. Why?
5. How much work did it take to get you across the gym?
6. What was your speed (speed = distance/time)?

Walking =

Running =