**PHYS 102     Average Speed and WORK & POWER Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Partner(s):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A. Measuring the average speed:**
Apparatus: meter stick, stop-watch, and person.

Procedure: In the hall-way determine your walking speed, twice, first for slow walk and then for fast walk, in m/s and express it in MPH.

Data: Write down every data you collect and show your work explicitly below.

**B. WORK & POWER**

**Purpose:** To investigate the work done and power developed by a person during walking & running up the steps.

Apparatus: meter stick, stop-watch, scale, and person.

Theory: Here we will look at WORK as defined below. We will assume that work only occurs when the force is sufficient to move the object. Work is a measure of what is done, not the effort applied in attempting to move the object. Work can be said to be energy in transit. Work has the same unit as energy.

Work = Force X Distance;    Power = Work/Time;    1 horse power = 1 hp = 746 W.



UNITS:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|      |   **Time** |   **Distance** |  **Mass**  | **Weight**  | **Velocity**  | **Acceleration**  | **Work**  | **Power**  |
| cgs |   s |   cm |   g |   dyne |   cm/s |   cm/s2 |   erg |   erg/s |
|   SI |   s |   m |   kg |   newton, N |   m/s |   m/s2 |   joule,J |   J/s = W |
|   BE/USC |   s |   ft |   slug |   pound, lb |   ft/s |   ft/s2 |   ft.lb |   ft.lb/s |

PROCEDURE

1. Find the weight of the person who is going to do the walking and running.

2. Walk out to the steps and measure the height of each steps, # of steps, and determine the height for one level.

3. Time the walking and running.

4. Repeat 1-3 for two levels, and complete the data table.

DATA:  (Use SI units)  Same person needs to do all the walking and running.

|  |  |  |
| --- | --- | --- |
|  | From 2nd floor to 3rd floor of Sims  | From 1st floor to 3rd floor of Sims |
| Walking | Running | Walking | Running |
| Weight |  |  |  |  |
| Height |  |  |  |  |
| Time |  |  |  |  |
| Work |  |  |  |  |
| Power |  |  |  |  |
| Horse Power |  |  |  |  |

Conclusion for B, Work & Power: