Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period:\_\_\_\_\_\_\_\_\_\_\_\_\_

Physics – Activity – Power

**Procedures**

1. Each of the 5 contestants will be timed running up a flight of steps.
2. Record the weight of each contestant
3. Record the time it takes to run the steps
4. Measure the height of the steps.
5. Complete the data table and calculations for: work done against gravity and power and horsepower. Note that 1 hp – 746 watts

**Data Table**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Contestant** | **Weight**  **(N)** | **Time**  **(s)** | **Height of the steps**  **(m)** | **Work**  **Accomplished**  **(J)** | **Power**  **(W)** | **Horsepower**  **(hp)** |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

**Conclusions**

1. List two factors that affect the power of the individual
2. Who was the most powerful in your group?
3. Explain why the contestant #2 was the most powerful.
4. The term horsepower was originally the amount of that a horse could do in one second. Many machines are given a horsepower rating. Why is more desirable to have a machine of 0.5 hp do work than a human of 1 hp.
5. What relationship exists between work accomplished and the power if time is constant.
6. What relationship existing between the time to complete work and the power if work is constant?
7. Determine the work done by lifting a 200 Newton bucket of water from a well a distance of 15 meters at a constant speed.
8. Determine the rate that the work was done (power) if it took 30 seconds to complete the task.
9. Determine the speed that the bucket was moving.
10. Determine the work that can be accomplished by a 1500 watt machine that operates for 500 seconds.
11. Determine how long will it take a 1500 Watt machine to do 900,000 Joules of work if it operates continuously?
12. What constant speed can a 1500 Watt machine lift a 750 N object?