# Tuesday Reading Assessment: Unit 7, Power and Conservation of Energy

Prof. Jordan C. Hanson

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## 1 Memory Bank

1. $KE = \frac{1}{2}mv^2$ ... Definition of kinetic energy
2. $P = \Delta E / \Delta t$ ... Definition of power
3. 1 calorie is 4.184 Joules
4. 1 kcal is 4184 Joules

| Activity | Energy consumption in watts |
|---|---|
| Sleeping | 83 |
| Sitting at rest | 120 |
| Standing relaxed | 125 |
| Sitting in class | 210 |
| Walking (5 km/h) | 280 |
| Cycling (13–18 km/h) | 400 |
| Shivering | 425 |
| Playing tennis | 440 |
| Swimming breaststroke | 475 |
| Ice skating (14.5 km/h) | 545 |
| Climbing stairs (116/min) | 685 |
| Cycling (21 km/h) | 700 |
| Running cross-country | 740 |

Figure 1:

## 2 Work, Power, and the Human Body

1. Suppose you are attending a conference for four hours, where you will be mostly be sitting and concentrating on speakers and workshops. (a) How many Watts does this require? (b) If the conference is four hours long, how many Joules in total do you expect to burn? (c) How many kcal is this? Is it much larger than or smaller than 2,000?

2. Based on the prior exercise, determine how many kcal would be necessary to run cross-country for four hours.