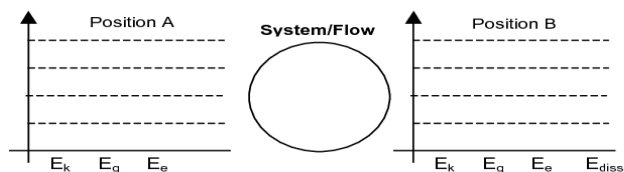


Energy Model Worksheet 4: Energy Transfer and Power

1. A student eats a tasty school lunch containing 700 Calories. (One food Calorie = 4186 Joules.) Due to basal metabolism, the student radiates about 100 Joules per second into the environment.

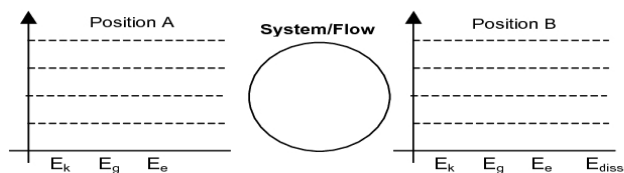
a. How long would the student have to sit on a couch to radiate away all of the energy from lunch?

b. If all of the energy from the student's lunch did something useful, like lifting pianos weighing 5000 Newtons to the top of a 10-meter tall apartment building, how many pianos could be lifted with the energy from lunch? (Ignore the energy radiated by the student.) Complete the energy bar graph below to aid your solution.



Energy Conservation Equation:

2. Jill pulls on a rope to lift a 12 kg pail out of a well, while the clumsy Jack watches. For a 10 meter segment of the lift, she lifts the bucket straight up at constant speed. How much power is required to complete this task in 5 seconds? Complete the energy bar graph as part of your solution.



Energy Conservation Equation: