

$$\text{SLEEP (1.2)} \times 8\text{h} \times 86\text{kg} = 825.6$$

$$\text{SIT (1.5)} \times 5\text{h} \times 86\text{kg} = 645.0$$

$$\text{LT. HWK (2.6)} \times 4.5\text{h} \times 86\text{kg} = 1006.2$$

$$\text{STAND (2.1)} \times 3\text{h} \times 86\text{kg} = 541.8$$

$$\text{WALK (3.1)} \times 2\text{h} \times 86\text{kg} = 533.2$$

$$\text{RUN (13.2)} \times \underline{1.5\text{h}} \times 86\text{kg} = \underline{1702.8}$$

TOTAL 24h

TOTAL = 5254.6 kcal

NAME \_\_\_\_\_ DATE \_\_\_\_\_ CLASS \_\_\_\_\_

**PHYSICAL EDUCATION CONNECTION****Chapter 5****Energy****FOOD ENERGY**

Food Energy is measured in Calories. The Calorie is defined as the amount of heat required to raise the temperature of 1 kg of water 1°C. A Calorie equals 1 kilocalorie (kcal) or 4.184 kilojoules (kJ). The following table lists the approximate amount of energy used in various exercises. Energy used is expressed in kcal/kg/h.

Activity	Energy Used (kcal/kg/h)
Laying down or sleeping	1.2
Sitting	1.5
Standing	2.1
Light housework	2.6
Walking 2.5 mph	3.1
Bicycling 2.5 mph	3.1
Bowling	4.0
Walking 4.0 mph	4.5
Volleyball	5.1
Tennis	6.2
Bicycling 13 mph	9.7
Running 10 mph	13.2

- Determine your mass in kilograms. Multiply this figure by the figures for each exercise to obtain the amount of energy you would use in an hour. For example, a 60-kg student playing volleyball would use  $60 \text{ kg} \times 5.1 \text{ kcal/kg/h} = 306 \text{ kcal/h}$ .
- Using this table, estimate your own daily energy expenditure. List your activities for a 24-hour period. Calculate the kilocalories expended. (Estimate the energy expenditures for activities not listed in the table.)

Activity	Time (h)	Calories Burned	Activity	Time (h)	Calories Burned
SLEEP	8	825.6	WALK	2	533.2
SIT	5	645.0	RVN	1.5	1702.8
LT. HWK	4.5	1006.2			
STAND	3	541.8			

Total Calories Burned: 5254.6

- You eat a pint of ice cream (514 kcal) with chocolate topping (125 kcal). Every 0.45 kg of body fat contains 4000 kcal of energy. Assume that your regular diet (without the ice cream) just maintains your current body mass.
  - How long will it take to burn it off if you are just sitting?
  - How many hours of tennis will it take to burn it off?
  - How much mass will you gain from the ice cream and topping if you do not exercise?

$$\begin{array}{r} \text{ICE CREAM} = 514 \text{ kcal} \\ \text{TOPPING} = 125 \text{ kcal} \\ \hline 639 \text{ kcal} \end{array}$$

$$\begin{array}{l} \text{SITTING (1.5)} \\ \text{MASS} = 86 \text{ kg} \\ t = ? \end{array}$$

$$\text{ENERGY} = \text{ACTIVITY} \times \text{MASS} \times \text{TIME}$$

$$639 \text{ kcal} = (1.5)(86 \text{ kg}) \times t$$

$$\frac{639}{129} = \frac{129}{129} t$$

$$4.9 \text{ h} = t$$

PLAYING TENNIS

$$\text{TOTAL Kcal} = 639 \text{ Kcal}$$

$$\text{ENERGY} = \text{ACTIVITY} \times \text{MASS} \times \text{TIME}$$

$$639 \text{ Kcal} = (6.2) \times (86) \times t$$

$$\frac{639}{533.2} = \frac{533.2}{533.2} t$$

$$1.2 \text{ h} = t$$

639 kcal

$$\frac{0.45 \text{ kg}}{4000 \text{ kcal}} \times \frac{m}{639 \text{ kcal}}$$

$$\frac{4000 \text{ m}}{4000} = \frac{(639)(0.45)}{4000}$$

$$m = 0.07 \text{ kg} = 0.2 \text{ lbs}$$