

## BIOLOGY 11 – PRE-LAB EXERCISE

# 10

Name: **Answer Key**

Lab Day &amp; Time:

# 5

### Energy Requirements & Ideal Weight

- The “Calorie” on a food label is equivalent to what unit of energy? **kcal**  
How many Calories are in 1 gram of carbohydrate? **4 Calories per gram**  
How many Calories are in 1 gram of fat? **9 Calories per gram**  
How many Calories are in 1 gram of protein? **4 Calories per gram**  
If peanut butter is about 25% protein / 60% oil / 15% sugar, how many Calories are in 1 tablespoon (= 16g) of peanut butter? [Round off to the nearest Calorie.]  
 $(16\text{g PB} \times 25\% \text{ protein} \times 4 \text{ kcal/g} = 16 \text{ kcal from protein}) + (16\text{g PB} \times 60\% \text{ lipid} \times 9 \text{ kcal/g} = 86.4 \text{ kcal from fat}) + (16\text{g PB} \times 15\% \text{ sugar} \times 4 \text{ kcal/g} = 9.6 \text{ kcal from carbohydrates}) = 16 + 86.4 + 9.6 = \mathbf{112 \text{ kcal total}}$
- What are the three components of your daily energy requirement [expenditure]?  
**basal metabolic rate; physical activity; specific dynamic action**
- One pound of body fat is equivalent to how many kcal? **3500 kcal**  
So if you consume 200 more kcal per day than your body spends, how much weight would you gain in one month?  
 $200 \text{ excess kcal per day} \times 30 \text{ days} = 6,000 \text{ excess kcal per month}$   
 $6000 \text{ kcal} \times 1 \text{ lb fat} / 3500 \text{ kcal} = \mathbf{1.7 \text{ lbs}}$  of fat gained per month
- If someone that weighs 160 lbs. has 28% body fat, what is their lean body weight (LBW)?  
**If 28% is fat, then 72% is lean.  $160 \text{ lbs} \times 72\% = \mathbf{115 \text{ lbs}}$**   
If they want to reduce their body fat to an “ideal” 23%, how much fat will they need to lose?  
**If only 23% will be fat, 77% will be lean. Since only fat is lost, LBW does not change (still 115 lbs.).**  
 $115 \div 77\% = 150 \text{ lb new body weight. } 160 \text{ lbs starting weight} - 150 \text{ lbs new weight} = \mathbf{10 \text{ lbs fat lost}}$
- According to the life insurance company statistics in **Table 10.5 & 10.6**, what does “ideal weight” mean?  
**The range of body weight associated with the lowest rate of mortality.**  
According to the life insurance company statistics in **Table 10.5 & 10.6**, what is **your** “ideal weight” range?

- Complete your **Physical Activity Diary** and **Food Diet Diary** for three full days!

#### A. Record all of your activities during a 24-hour period.

The list is for *your personal use*, so make it as accurate as you can. There are 24 hours in a day, which equals 1440 minutes. If you do not reach this total, then you have left something out.

Use **Table 10.3** to assign an “Activity Level” to each activity as **Sleep** (0), **Sitting/Standing** (0.01), **Very Light** (0.02), **Light** (0.025), **Moderate** (0.04), **Heavy** (0.07), or **Severe** (0.11).

[“Severe” means competitive sport level.]

#### B. Record everything you eat/drink during the same 24-hour period.

List what you eat and the amount. Include all condiments and “extras”, such as the sugar and cream you put in your coffee and the mayonnaise on your sandwich. The more detailed your list, the more accurate the information you will receive about your diet when we do the lab. Use an additional sheet of paper to elaborate on the detailed ingredients. The more “typical” this day is of your normal eating habits, the better.

Read food package labels carefully to help determine Calories and to identify what they call a “serving size.” Many restaurants, especially fast food chains, publish nutrition guides for their products. See the table on p. 8–4 for some web addresses with online guides.