Lesson Plan 4
Metabolism

Subject: Wellness

Course/Grade: 4-8

Objectives/Outcomes:

- Demonstrate understanding of metabolism and how it can affect an individual.
- Demonstrate understanding of the factors that determine body shape and size.
- Complete Daily Caloric Requirement worksheet and demonstrate understanding of caloric intake and the relationship between caloric intake, activity level and their impact on a person's weight.

Curriculum Framework Standard(s):

- 3.2 Use the USDA Food Guide Pyramid and its three major concepts of balance, variety, and moderation to plan healthy meals and snacks
- 3.4 Identify heredity, diet, and physical activity as key factors in body shape and size
- 3.11 Analyze dietary intake and eating patterns

Procedure:

1. **"Frontloading" (Before):**
    a. Preparation and Planning-
        i. Students need to be familiar with the following: calories, nutrients, balance, variety, moderation, the food guide pyramid and its purpose, difference between a sedentary and active lifestyle.
        ii. Define metabolism as the process of taking in energy in the form of food measured in calories, and then using that energy/calories during your daily activities, or storing any excess energy/calories in the form of body fat.
        iii. Ask students what the three primary factors in determining body shape and size. Explain factors heredity, diet and exercise.
        iv. Explain the concept of daily caloric requirements. Discuss what creates differences in each person's caloric requirements.
        v. Send students the daily caloric worksheet and walk them through calculations to figure their daily caloric requirements.
        vi. Define obesity and discuss unhealthy routines. Help students make the connection between calories, exercise and weight. Taking in more calories than you can burn will lead to weight gain and potentially obesity.

2. **Assistance and Associations (During)**
    a. Have student's complete Daily Caloric Requirement (DCR) activity sheet.
    b. Ask students to compare and contrast differences in requirements for an active teenager and a professional football player.

3. **Reflection & Readiness for Application (After)**
    a. Have students brainstorm menu ideas for the Patriots player they chose to use on the DCR activity sheet based on their calculated DCR, keeping in mind the concepts of balance, variety and moderation.
    b. Discuss with students what might happen to an NFL player's DCR after they retire from the NFL, when their intense activity level most likely would decline.

Nutrition Fact Sheet

Calories: amount of energy in food

Macronutrients: provide energy- they are carbohydrates, fats, and proteins

Micronutrients: regulate body functions: they are vitamins, minerals, and water

Non-nutrients or empty calories: foods with no nutritional value, they are often processed or refined

Heredity: an individual's genetics, beyond a person's control. People can be genetically tall, thin, short, or muscular.

Diet: everything you eat and drink. Each person needs to eat a different amount of food to maintain a healthy weight

Physical Activity: like diet, helps people to maintain a healthy weight

Balance

Variety

Moderation

Obesity: Occurs when there is an excess of fat, or adipose tissue, in the body

Adipose tissue: a type of connective tissue in which many cells are filled with fat. The body needs adipose tissue, but too much can result in serious health problems.

- There are **six** basic nutrients that are divided into two categories, which are **Macronutrients** and **Micronutrients**.
- **Heredity**, **diet** and **physical activity** are three primary factors that determine a person's body shape and size.
- **Diet** and **physical activity** are factors that are within a person's control, **heredity** is not.
- Balance, variety and moderation are three important concepts in planning a healthy diet.
- The food guide pyramid is a helpful tool for planning a balanced diet. To get more information on the food guide pyramid go to www.mypyramid.gov.
- **Obesity** can lead to many other problems and diseases such as:
    - Diabetes
    - Stroke
    - Heart Disease
    - Arthritis
    - Hernia
    - Strain on Circulatory System
    - Hardening of the Arteries
    - High Blood Pressure

Daily Caloric Requirement Worksheet

Use the following steps to calculate your DCR:

1. Your ideal healthy weight: _____
2. Multiply your healthy weight by 10: _____
3. If female add 150, if male add 300 to the previous number: _____
4. Circle the activity level below that best describes you:

   Sedentary (add 0) Somewhat active (add 250) Very active (add 500)

5. Add question 3 to question 4: _____ This is your approximate DCR.

Use the following steps to calculate your New England Patriots Player DCR

1. Roster weight of New England Patriot _____ : _____
2. Multiply roster weight by 10: _____
3. Add 300 to the previous number: _____
4. Circle the activity level below that best describes a New England Patriot:

   Sedentary (add 0) Somewhat active (add 250) Very active (add 500)

5. Add question 3 to question 4: _____ This is your Patriot's approximate DCR