



Lesson Plans > Grades 9-12

Winning Dietary Choices

Time Frame:

2-3 class periods

Overview:

Students will analyze the nutrients on food labels, gain awareness of the nutrients that provide calories and how those nutrients help athletes, and design a pre-game diet for an imaginary athlete.

Objectives

- Make predictions about the caloric value of select foods and beverages.
- Analyze the nutrients of several foods based on their Nutrition Facts panels.
- Research the role of fat, protein, and carbohydrates in our diet as well as their impact on athletes.
- Create a Power Point presentation to present nutrient research.
- Identify recommended protein and carbohydrate choices for an imaginary athlete.

Materials:

Nutrition Facts panels (Each student must bring one Nutrition Facts panel to class)

Access to Internet

Access to Power Point

Calculators

“Winning One Day Diet” student handout (one per student)

Lesson Background:

Balance, variety, and moderation are important concepts that can help kids lead a healthy lifestyle.

A **balanced** diet incorporates appropriate amounts of foods from all five food groups every day, providing needed calories and nutrients. Age, gender and physical activity level make a difference in the number of servings needed to maintain a well-balanced diet. The United States Department of Agriculture’s (USDA) MyPlate food guidance system (www.choosemyplate.gov) illustrates the five

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food groups that are the building blocks for a healthy diet using a familiar image—a place setting for a meal. Before students eat, they should think about what goes on their plate or in their cup or bowl. To build a healthy plate, children need to eat a balanced diet from the following food groups: fruits, vegetables, protein, grains, and dairy. Specific recommended serving sizes by age group can be found at <http://www.choosemyplate.gov/food-groups/>.

Variety: No single food supplies all the nutrients we need. A varied diet includes many different foods from the five major food groups: fruits, vegetables, grains, protein and dairy, which together meet nutritional recommendations.

Moderation: Moderation is all about limiting rather than eliminating certain foods and paying attention to serving sizes. Children, in particular, should know that their diet can include all the foods that they like. Those that are not as nutrient-rich or that are higher in nutrients that should be limited should simply be eaten less frequently or in a lower quantity. This is called moderation. Moderation also relates to portion control. Portion sizes for many foods have increased over the years and many Americans tend to eat the amount that is placed onto their plate or poured into their cups! The recommended amounts for each food group from the Dietary Guidelines and information about serving sizes on the Nutrition Facts Panel can help guide how much we should be eating each day.

An Athlete's Diet

To help athletes reach peak performance, they must train hard, stay hydrated, and eat a balanced diet. Athletes get their energy from calories in the foods and beverages they consume. The three nutrients that provide energy (calories) are protein, carbohydrates, and fat.

Protein

Our bodies need a steady supply of protein to build and repair muscles, nerves, bones, and blood. But protein can't be stored as protein. Whenever we eat more protein than our body needs for tissue building, it will be either used for energy or stored as fat. Exercise can increase an athlete's need for protein. On average, athletes in heavy training and very physically active people need up to 50% more protein than casual athletes. The exact amount depends on how intensely, how long and how often we exercise, the quality of protein we eat, and other factors. If we don't eat enough energy-supplying carbohydrates and fats, our body will burn protein for energy. Tissue building and repair will be delayed until more protein is available. An athlete trying to lose weight by eating less fat especially needs to eat enough protein to prevent muscle wasting.

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If you're just beginning to train, you need more protein than an athlete who's already highly trained because a trained body burns more fat as fuel and reserves more protein for muscle growth and repair. Although athletes need more protein, not all very active people need to eat more. Many Americans already eat more protein than they need. But, athletes who get most or all of their protein from vegetable sources and eat few animal foods may need to consume more – especially higher-quality protein foods. Egg protein is so efficiently used for growth that its biological value (93.7%) is higher than that of any other natural food. For these reasons, some athletes fortify their diets with eggs.

Carbohydrates

Carbohydrates are an important source of energy for athletes. They are vital for muscular energy and brain function. Carbohydrates can be stored in our muscles as glycogen and used for quick energy, like the kind we use when we perform in athletic events. In the early stages of moderate exercise, carbohydrates provide 40 to 50 percent of the energy requirement.

Complex carbohydrates come from foods like pasta, beans, cereals, and other grain products. Simple carbohydrates can be found in fruits, milk, and sugar. As it is digested, the body breaks down carbohydrates to glucose and stores it in the muscles as glycogen. Then glycogen is converted during exercise back to glucose and used for energy.

If an athletic event lasts for less than 90 minutes, the glycogen can supply the needed energy. For events that are more than 90 minutes, athletes often eat a high-carbohydrate diet for two-to-three days before the event so they can store more glycogen. A high carbohydrate diet constantly is not advised.

Fats

Fat also provides body fuel to an athlete. Using fat as fuel depends on an event's duration and the athlete's condition. Trained athletes use fat for energy more quickly than an untrained athlete. Consumption of fat should not fall below 15 percent of total energy intake because it may limit performance.

Hydration

Athletes should start any event hydrated and replace as much lost fluid as possible during the event. The best way to stay hydrated is to drink before, during, and after exercise. Water is the best form of hydration prior to an event. If the event lasts longer than an hour, sports drinks can help to replace electrolytes.

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Engage (20-30 minutes)

Note: Before class, ask each student to bring in a Nutrient Facts panel for any food or beverage of their choice.

1. Write the question, “What is energy?” on the board and ask students to journal their answers for two to three minutes. Direct students to form groups of four. Ask group members to share answers and try to reach consensus on an answer that incorporates all of their feedback. Answers may vary but, for this lesson, guide students to think about food energy, which is the energy that an animal (including humans) gets from the food and beverages it consumes.
2. Ask students if they know where we get the energy we use to do everything from breathe to run a marathon. Guide students to answer that our energy comes from calories in foods and beverages.
3. Ask students to list the names of the foods/beverages group members chose for the Nutrition Facts panel assignment. Note: Do not look at the panels yet.
4. Challenge each group to rank the foods/beverages from the one that they predict has the highest number of calories per serving to the one that provides the fewest number of calories per serving. Ask groups to present and justify their answers.
5. Then, ask students to read the Nutrition Facts panels to compare their group’s predictions with the actual rankings.
6. Ask students if they think that foods with a high number of calories are always the best choice to provide energy before physical activity. For example, some foods that are high in calories just provide a short burst of energy while others are best for sustained energy. And some foods are more nutrient-rich than others. What other information on the Nutrient Facts panel might students review to help them make healthful nutrition choices?



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Explore (60-90 minutes)

7. Tell students that there are three nutrients that give us energy (calories): carbohydrates, protein, and fat. Explain that there are other nutrients that provide value in our diet but they do not provide caloric value. Examples include vitamins and minerals. Explain what a nutrient-dense food is (a high nutrient content compared to the calories).
8. Ask each group to select one of these three nutrients (carbohydrates, protein, or fat) and to research the following information:
 - What is the nutrient? If there are different types of this nutrient, what are they?
Ex: Complex vs. simple carbohydrates. Saturated, monounsaturated, and polyunsaturated fat. Complete and incomplete protein.
 - What is the nutrient's main function in the body?
 - How is this nutrient stored in our bodies?
 - Why is this nutrient important for athletes? How much of and when should this nutrient be consumed for athletes?
 - What are some foods that are high in this nutrient?
 - How many calories per gram of this nutrient are there in foods and beverages?
Ex: There are four calories in each gram of protein. If a food has four grams of protein, it gets 16 of its calories per serving from protein.
9. Challenge each group to create and present to the class a Power Point presentation about its nutrient.
10. Then, ask each group to draw conclusions about how all three nutrients work together to help athletes as they train and compete.

Explain (15-20 minutes)

11. Based on this information, challenge each group to go back to the Nutrition Facts panels they brought in and rank which foods, if any, would be healthful choices for athletes in training to consume. Have them justify and present their answers. Remind students that all foods can fit into a healthful diet in moderation but some choices are better than others.

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Elaborate (60-90 minutes)

12. Explain that kids their age need a certain number of calories each day. The number of calories they need depends on several things including their age, their gender and how active they are.
13. Have students go to <http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/downloads/-calreqtips.pdf> where they will find a chart of how many calories they need on an average each day.
14. Explain to students that, in addition to just tracking calorie intake, athletes must get the right balance of carbohydrates, fat, and protein before and after their athletic events. In the case of a long event such as a marathon, they must also consider what they consume during the event.
15. Distribute the “Winning One-Day Diet” student activity sheet.
16. Have each group imagine that they have been asked to recommend foods/beverages that an athlete should consume the day before his or her event, based on their protein, carbohydrate, and fat content.
17. As is outlined on the activity sheet, they must:
 - Create an athlete’s profile including age, gender, weight, sport, and level of competition.
 - Research information about the type of diet that is recommended for that athlete just before competition. Pay special attention to the recommended balance of carbohydrates, fats, and protein.
 - Calculate the number of calories the athlete should consume.
 - Outline the foods/beverages their group would recommend to the athlete to eat the day before the competition.
 - Justify and present the choices, based on their research.

Evaluate (20-30 minutes)

Have groups evaluate each group’s choices and identify which one-day diet would best prepare the imaginary athlete for his or her event.

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Standards:

CCSS ELA Standards

- CCSS.ELA-Literacy.CCRA.W.9-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- CCSS.ELA-Literacy.CCRA.W.9-12.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
- CCSS.ELA-Literacy.CCRA.W.9-12.8 Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
- CCSS.ELA-Literacy.CCRA.W.9-12.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.
- CCSS.ELA-Literacy.CCRA.SL.4-6.1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- CCSS.ELA-Literacy.CCRA.SL.4-6.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

CCSS ELA Standards Science & Technical Subjects

- CCSS.ELA-Literacy.RST.9-10.7 Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words
- CCSS.ELA-Literacy.RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

National Science Education Standards

- 4FSPSPS.2- Individuals have some responsibility for their own health
- 4FSPSPS.3- Nutrition is essential to health

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A Winning One Day Diet

Athletes get energy from the calories they consume through food and beverages. The three nutrients that provide calories are carbohydrates, fats, and proteins. The number of calories and balance of nutrients for athletes depends on many things: their age, gender, sport, training level, and the day (a different balance of carbohydrates, fats and proteins is often needed a week before an event vs. the day before an event vs. the day after). For this activity, you will recommend specific foods and beverages to help an imaginary athlete meet his or her calorie requirements the day before an event.

Athlete Profile

Name of athlete:

Gender:

Age:

Weight:

Sport:

Competitive Level (Olympic, professional, college, high school, competitive, amateur, recreational)

Information About Nutritional Requirements for Specific Sport

Information About Nutritional Requirements Day Before Event



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Recommendations**

Use the following formulas as a guide to calculate an athlete's recommended daily intake:

Daily Carbohydrate Intake: Depending upon the length of training sessions, an athlete's carbohydrate intake should be between 2.5-6.0 grams per pound of body weight, with longer training times reflecting the higher number of grams needed.

Athlete's weight x 2.5-6.0 grams = Daily carbohydrate Intake

Daily Protein Intake: Endurance athletes should consume between 0.54-0.64 grams per day.

Athlete's weight x 0.54-0.64 grams = Daily protein intake

** Formulas taken from Optimal Dietary Intake: The Basics for Sport, For Life
(<http://www.usada.org/files/active/athletes/NutritionBookletFinal.pdf>)