NUTRITION 101:
A Taste of Food and Fitness

Lesson 3
The Energy Nutrients
CONTENTS

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Fast Facts About Energy Nutrients Handout

Resource–Web Sites of Organizations: Grains, Milk, and Meat and Beans Food Groups and Fats and Sweets Handout

Nutrition Facts Label Handout

Cafeteria Connection–Energy Balance Handout

Nutrition Nuggets–Food Allergies, Intolerances, and Adverse Reactions Handout

Personal Discovery Assessment–Pantry Patrol Handout

Key for Icons

SAY
DO
PREPARE
TASTING ACTIVITY
PHYSICAL ACTIVITY
VIDEO SCENARIO
SLIDE
Lesson 3 at a Glance
The Energy Nutrients

What To Do Ahead of Time

- Review the lesson and the slides for The Energy Nutrients.
- Review all handouts and activities; make copies for participants.
- Practice the Physical Activity Booster.
- Prepare the Tasting Activity supplies.
- Set up equipment needed, including computer, projector, and DVD player.
- Cue video to appropriate starting point.

Learning Objectives

1. Identify the energy nutrients, protein, carbohydrate, and fat, a major function each plays in a healthy body, and food sources of each.
2. Identify information on the Nutrition Facts label related to protein, carbohydrate, and fat.
3. Describe how school meals are planned to balance the energy nutrients and contribute to students’ health and ability to learn.

<table>
<thead>
<tr>
<th>Time</th>
<th>Content Area of Lesson 3</th>
<th>Resource to Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 minute</td>
<td>Welcome and Brief Review of Lesson 2</td>
<td>Slide 1</td>
</tr>
<tr>
<td>2 minutes</td>
<td>Physical Activity Booster–Building Strength</td>
<td>Slide 2</td>
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<tr>
<td>12 minutes</td>
<td>The Energy Nutrients Present lesson.</td>
<td>Slide 3-12</td>
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<tr>
<td>2 minutes</td>
<td>Tasting Activity–Healthful Desserts</td>
<td>Slide 13</td>
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<td>Tasting supplies</td>
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<tr>
<td>2 minutes</td>
<td>The Energy Nutrients Presentation continued</td>
<td>Slide 14</td>
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<tr>
<td></td>
<td>Distribute handouts.</td>
<td>Fast Facts About Energy Nutrients</td>
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National Food Service Management Institute
A Taste of Food and Fitness: Nutrition 101
<table>
<thead>
<tr>
<th>Time</th>
<th>Content Area of Lesson 3</th>
<th>Resource to Use</th>
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<tbody>
<tr>
<td>1 minute</td>
<td>Nutrition Facts Label</td>
<td>Slide 15</td>
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<td>Distribute handouts.</td>
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<td>Review briefly.</td>
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<tr>
<td>1 minute</td>
<td>Nutrition Nuggets–Food Allergies, Intolerances, and Adverse Reactions</td>
<td>Slide 16</td>
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<td>Review briefly.</td>
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<td>Distribute handouts.</td>
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<tr>
<td>2 minutes</td>
<td>Cafeteria Connection–Energy Balance</td>
<td>Slide 17</td>
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<td>Distribute handout.</td>
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<td>Briefly review.</td>
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<tr>
<td>5 minutes</td>
<td>Video Scenario</td>
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<td>View video and discuss.</td>
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<tr>
<td>2 minutes</td>
<td>Personal Discovery Assessment–Pantry Patrol</td>
<td>Slide 19</td>
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<td>Distribute handout.</td>
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<td></td>
<td>Briefly review.</td>
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Conclude the session.
The Energy Nutrients

SLIDE 1
Nutrition 101: A Taste of Food and Fitness
Lesson 3—The Energy Nutrients

SAY: Welcome back to Nutrition 101: A Taste of Food and Fitness. Does anyone have a question or observation from our last lesson?

Instructor’s note: Briefly cover any questions. If the question is detailed, ask the participant to discuss it with you after the lesson.

SLIDE 2
Physical Activity Booster–Building Strength

SAY: This activity booster focuses on strength.

Remember, anyone under a doctor’s care for any injury or health condition needs to be cautious when doing the activity. Please follow your doctor’s advice. If necessary, just observe the activity.

DO: Show how to do a wall push-up before you lead the participants through the activity.

Have participants stand facing a wall, about 1 foot away from the wall. Place each hand on the wall, with fingers spread in firm contact with the wall. Hands should be a participant’s shoulders width apart on the wall.

Have participants stand straight and tighten stomach muscles. Hold the body straight as a plank and while bending the arms, lower the body to the wall with control. Lower as far as it is comfortable or until the nose touches the wall. Push hands firmly against the wall to raise the body back to standing position, keeping the stomach muscles tight. The action is similar in style to doing a push-up on the floor.

Continue to do wall push-ups until tired or for 1 minute.

Have participants return to their seats.
In our previous activity boosters, we have focused on the steps we take each day and on flexibility. Another important part of physical activity is strength. Wall push-ups are an easy way to build strength in our arms. Walls can be found nearly anywhere. They are very affordable exercise equipment.

Working our muscles is important for many reasons. First, it helps keep us strong. Second, muscle tissue burns calories even when it is resting. Third, working our muscles provides a great way to understand how our bodies use protein, carbohydrate, and fat from the foods we eat. That is the focus of today’s lesson.

This meal looks good, doesn’t it? These appetizing foods make a delicious meal. You can almost smell the aromas and taste the flavorful combinations.

When we look again at the foods in this meal, we see what these foods provide to our bodies. These foods provide the energy nutrients protein, carbohydrate, and fat. All three types of nutrients are essential to our good health.

Protein is the building block of muscles, body tissues, and blood cells. The enzymes and hormones that regulate body functions contain protein. Protein is essential for growth and development. Protein repairs and replaces body tissue and enhances the immune system. The digestive system breaks protein foods down into tiny parts called amino acids that are absorbed into the blood stream. The body uses amino acids for muscles, tissues, enzymes, and other body needs for protein. Protein digests slowly and helps provide a feeling of fullness. When the stomach has a feeling of fullness, or satiety, it signals the brain to stop eating.

Sources of Protein
- Animals Foods (meat, fish, poultry, eggs, milk, and milk products)
- Plant Foods (dried peas and beans, lentils, nuts, and seeds)
Protein is found in animal foods such as meat, fish, poultry, eggs, milk, and milk products such as cheese and yogurt.

Protein is also found in vegetable or plant sources, such as dried peas and beans, lentils, nuts, and seeds. The MyPyramid groups these foods into two groups, the Milk group and the Meat and Beans group. Most individuals can meet their daily protein needs with 3 cups of milk and 5 ounces of lean meat or an equivalent amount of beans.

SLIDE 6
Protein Facts
• Provide 4 Calories Per Gram
• Provide Energy When Needed
• Stored as Fat if not Needed

SAY: Most Americans eat plenty of protein-rich foods, primarily from animal sources. In many cases, protein intakes are higher than the recommended levels. Protein provides 4 calories per gram. A gram is the unit of measure for the energy nutrients in nutrition science. A gram weighs about the same amount as a paper clip. The body only needs a certain amount of protein to maintain tissues and regulate body functions.

Extra protein beyond these needs is converted into energy and may be stored as fat. The body can use protein for energy, but it is neither the most efficient source of energy nor the best use of protein in the body.

SLIDE 7
Carbohydrate Provides Energy
• Heart, Lungs, and the Brain
• Growth and Development
• Activity

SAY: Carbohydrate is the body’s preferred source of energy. In fact, providing energy is carbohydrate’s major role. Energy needs are determined by basic body processes.

The heart, lungs, brain, and other organs demand constant energy.

Rapidly growing children and teens require energy for growth and development.

Carbohydrate fuels the muscles. Some carbohydrate is stored in the large muscles for a ready energy source.

Active lifestyles increase energy needs.
SLIDE 8
Sources of Simple Carbohydrates
- Fruit
- Milk
- Some Vegetables
- Honey
- Refined Sugars

SAY: Carbohydrate occurs naturally in two forms, simple and complex. Simple carbohydrates are sugars. Sugars occur naturally in fruit, milk, some vegetables, and honey. Refined sugars from sugar beets, sugar cane, and corn are often added to foods during processing or preparation.

The digestive system digests sugars by breaking the single connections between units. Simple sugars are easily digested, enter the blood stream quickly, and provide quick energy.

SLIDE 9
Sources of Complex Carbohydrates
- Grains
- Starchy Vegetables
- Legumes

SAY: Complex carbohydrate or starch is made of the same compounds as sugar, just many more. Because there are so many units connected together, starch takes longer to digest. Thus, the energy from starch enters the blood stream more slowly and is a sustained energy source. Starch also contributes to satiety or the sensation of feeling full.

Starch is found in grains, starchy vegetables, and legumes. Whole grains, vegetables, fruits, beans, and nuts also provide dietary fiber, another form of complex carbohydrate.

Most fiber is a type of carbohydrate we don’t digest. Dietary fiber helps keep the digestive tract running smoothly. Fiber also helps us feel full. Smaller amounts of soluble fiber can be absorbed by the body. Soluble fiber helps lower cholesterol levels in the blood. Oats is an example of a good source of soluble fiber.

SLIDE 10
Carbohydrate Facts
- Fuels the Brain
- Provides 4 Calories per Gram
- Provides Source of Stored Energy
- Stored as Fat After Energy Needs are Met
SAY: MyPyramid suggests a variety of foods for carbohydrates each day. Six 1-ounce servings of grains, with at least half of those choices being whole grains, 2 cups of fruits and 2 cups of vegetables daily are recommended to provide carbohydrate including fiber.

Most Americans eat carbohydrate-rich foods. In many cases, simple sugar intakes from soft drinks, candy, and desserts are higher than advised for good nutrition. Intakes of fiber-rich whole grains, fruits, and vegetables are often below recommendations. Some popular diets suggest that carbohydrates (sugars and starches) increase weight gain; some diets even restrict carbohydrate intake.

Carbohydrate is a critical nutrient. In Lesson 1, we learned the brain requires a steady supply of fuel. Carbohydrate is the source of that fuel.

Carbohydrates provide the same amount of calories as protein, 4 calories per gram. Carbohydrate not used for current energy needs is stored. Some carbohydrate is stored in the muscles and liver for immediate use when needed.

Once those stores are full, any extra carbohydrate is converted to fat and stored on the body.

SLIDE 11
Fat Facts
- Provides a Concentrated Source of Energy
- Provides 9 Calories per Gram
- Found in Every Cell
- Cushions Vital Organs
- Carries Vitamins A, D, E, and K
- Adds Flavor
- Imparts a Feeling of Fullness (satiety)

SAY: Fat is the most concentrated source of energy.

Fat provides over twice the amount of calories of protein or carbohydrate, 9 calories per gram. Fat has many important roles in the body.

Tiny amounts of fat are in every cell in our body. Fat cushions and protects our organs. Hormones that regulate body functions contain fat. Fat is essential to the development of a healthy brain and nervous system. Fat carries and helps the body absorb vitamins A, D, E, and K. Fat is stored energy the body relies upon when carbohydrate isn’t available. Fat provides flavor to food. Fat takes longer to digest than carbohydrate and helps promote satiety. The right amount of fat in the diet promotes health. However, eating too much fat can lead to overweight and related health concerns.
SLIDE 12
Balance Fat Intake by Selecting
• Lean Meats
• Lower Fat and Fat-Free Milk and Milk Products
• Low-Fat Cooking Methods
• Some Nuts and Seeds
• Limited Added Fat

SAY: Fat occurs naturally in meats, fish, poultry, dairy products, nuts, seeds, and avocados. Fats, such as shortening, butter, lard, vegetable oils, and hydrogenated vegetable oils, are added to foods in processing and preparation. Spreads, such as margarine and butter, and dressings, such as mayonnaise and salad dressings, are other forms of added fats.

MyPyramid is designed to help keep dietary fat in balance. The Dietary Guidelines advise choosing lean meats, lower fat and fat-free milk and milk products, grains and vegetables prepared with little added fat, nuts and seeds in small portions, and limited added fats.

Fats require special attention because they are calorie-rich or dense. Fat not used for body functions or energy needs is stored as body fat.

Good nutrition involves balancing calories eaten and calories used for body functions and activity. It also requires a balance between sources of energy. The body saves and stores any extra calories beyond what it needs from any source, protein, carbohydrate or fat.

This lesson started with a strength building activity. Think about what roles protein, carbohydrate, and fat play in the body. Muscles made of protein burn carbohydrate for energy when they work. When muscles work for an extended period, they deplete carbohydrate stores and use fat for energy. Muscles burn calories two ways—during exercise and later at rest. Muscle tissue requires energy even at rest, but fat tissue uses very little energy.

SLIDE 13
Tasting Activity–Healthful Desserts

Prepare for the Activity

Supplies needed:
Assorted fruit and grain based desserts such as fruit cobbler, crisp, and reduced fat baked products made from USDA recipes.

DO: Give each participant a sample of the healthful dessert you prepared ahead of time.
SAY: The focus of the taste experience is healthful dessert. Please feel free to observe the activity if there is a reason you cannot actively participate in the tasting experience.

Think about these questions.

Did you enjoy the dessert?  
Did you miss any flavors?  
Would you serve this dessert to your students?  
What are other healthy desserts you could add to the menu?

Remember, most foods can fit into a healthy school meal just like in our own diets. Grains and fruits are a great dessert choice. Try a variety of the USDA recipes to entice students to make healthy choices.

SLIDE 14
Fast Facts about Energy Nutrient


SAY: The handout, Fast Facts About Energy Nutrients, is a summary chart of the information we covered today.

It is a handy reference for remembering the roles and food sources of protein, carbohydrate, and fat.

The Resource–Web Sites of Organizations I: Grains, Milk, Meat and Beans Food Groups and Fat and Sweets is a listing of many different organizations that promote foods that provide protein, carbohydrate, and fat. Most have recipe ideas and more nutrition information available for use at home and in school food service.

SLIDE 15
Calories Count and Serving Size Matters

DO: Distribute the Nutrition Facts Label handout.
In Lesson 2 we learned how to find the serving size, number of servings per package, and the nutrition information based on that serving size on the Nutrition Facts label. Labels also provide information about protein, carbohydrate, sugars, fiber, and fats. The Nutrition Facts label combined with MyPyramid and the Dietary Guidelines can help guide healthful food choices.

The saying “Calories Count” is true. The amount of protein, carbohydrate, and fat in a food determines its calorie profile.

A food’s serving size also helps determine its total calories. The Nutrition Facts label is a great tool to use to keep calories in balance. The Nutrition Facts Label handout highlights the label’s information on protein, carbohydrate, and fat per serving.

School food service uses standard servings in meal service. This practice helps provide students with meals balanced in protein, carbohydrate, and fat to meet health needs. Knowing what a standard serving looks like can help you notice when portion sizes are large in other food settings. Use these skills outside of the cafeteria to decide how many servings are in a portion. Restaurant portions are not always labeled, although menus give some hints (e.g., 8-ounce steak). Often restaurant portions are much larger than standard servings or the serving size listed on packages of food.

Balanced meals fuel school performance

Balancing protein, carbohydrate, and fat in meals does more than provide the body with fuel and necessary nutrients. Balanced meals contribute to optimal work performance in school.

This lesson’s Cafeteria Connection shows how balanced meals contribute to students’ performance at school. A balanced breakfast keeps a student from feeling hungry mid-morning or late afternoon. The brain receives a steady supply of fuel and that helps a student focus, solve problems, and learn.


SAY: This lesson’s Cafeteria Connection shows how balanced meals contribute to students’ performance at school. A balanced breakfast keeps a student from feeling hungry mid-morning or late afternoon. The brain receives a steady supply of fuel and that helps a student focus, solve problems, and learn.
DO: Distribute Nutrition Nuggets–Food Allergies, Intolerances, and Adverse Reactions.

SAY: Sometimes the body has a reaction to a food. This Nutrition Nuggets briefly covers the differences between a food allergy, intolerance, and adverse reaction.

Note to Instructor: If preferred, ask ahead of time for volunteers to role-play the scenario. Scenario 3 has four characters, two students and two teachers.

Script for Scenario

The scene takes place in the hallway at school. Students and teachers would be getting ready for lunch.

Student 1
Are you ready to go eat? It’s spaghetti today.

Student 2
Great! That’s my favorite. Let’s go.

Students walk out of the scene.

Teacher 1
Are you eating in the cafeteria today?

Teacher 2
Oh, I can’t eat school lunch. I did that the first year I worked here and gained 10 pounds.

End the scene.

DO: View video or role play the scenario and discuss briefly.

SAY: In this scene we see that our teachers do not understand that the lunch menu is planned to meet the nutrient and energy needs of students. Remember from our earlier discussion adults may not need as many calories as growing children or teens unless they are very active physically. Few adults are involved in intensive physical activity today. Adults can enjoy a school meal without gaining weight. Just remember adults’ energy needs are often less than the meal provides. Teachers and other school staff could ask for smaller portions, eat less of the foods served, and/or increase their physical activity. Encourage adults to participate at breakfast and lunch. When adults enjoy coming to the cafeteria, students have a positive adult role model to follow.
Personal Discovery Assessment–Pantry Patrol

How many different whole grains do you usually eat?

✔ DO: Distribute Personal Discovery Assessment–Pantry Patrol.

 SAY: Finally, there is a Personal Discovery Assessment activity to do before the next lesson.

The goal of this week’s Personal Discovery Assessment is to become more aware of the many whole grain foods available other than oatmeal and whole wheat bread.

During the next week, look around your cupboards and pantry for these tasty treats from nature’s bounty. Put a check mark in the box next to the grain if you eat it regularly. If you don’t have many boxes checked, take some extra time at the grocery store and look for these grains. Many are available in the bulk food sections, health food sections, and natural food stores. Make a plan to try a grain you don’t usually eat. Treat your taste buds to a new flavor. Give your body a nutrition boost with a new whole grain each week.

This assessment activity is for your personal use. I will not be collecting these papers. You will use the completed activities in a future lesson. At that time you will be invited to share personal insights if you wish. The main purpose of the assessment activity is to give you an opportunity to learn more about your own eating habits.

✔ DO: Conclude the session and remind participants to bring all materials to the next lesson.