



Throughout the guide teaching tips are in red.

Activity Description and Estimated Class Time

In this three-day activity, students will evaluate the nutritional value of a fast food meal they choose. During this evaluation students will understand the components of food and their importance for the human body. Students will also consider how to plan a healthy diet and ways to improve their health through exercise.

Objectives

Students will develop an understanding of the following ideas and content:

- How to analyze the nutritional value of food;
- How food provides the energy and the molecules required for building materials, growth and survival of all organisms;
- How a healthy diet and exercise contribute to the overall health of the body.

Correlations to North Carolina Science Standards

8.L.5 Understand the composition of various substances as it relates to their ability to serve as a source of energy and building materials for growth and repair of organisms.

8.L.5.1 Summarize how food provides the energy and the molecules required for building materials, growth and survival of all organisms (to include plants).

8.L.5.2 Explain the relationship among a healthy diet, exercise, and the general health of the body (emphasis on the relationship between respiration and digestion).

Brief Science Background for the Teacher

The scientific study of human nutrition seems shifting and inexact. It is really more a science of setting limits. At one end of the spectrum, scientists know the diseases caused by deficiencies in certain nutrients. At the other end, scientists know the effects of exceeding limits. Ideally, we should all find a balance. With that in mind, the United States Department of Agriculture (USDA) developed and mandated the use of food labels. These labels use the % Daily Value metric to indicate the nutrients that should be limited in the diet—total fat, saturated fat, cholesterol, trans fats, and sodium—as well as the nutrients that should be consumed in adequate amounts—dietary fiber, vitamins A and C, Calcium, and Iron. Food providers, however, can manipulate the system by adjusting the portion size related to what people usually consume. For example, a 20 oz. soft drink bottle actually contains 2.5 servings with regard to the nutrient values listed on the label.

How does our body use the nutrients in food? **Carbohydrates** serve as a source of quick energy. The body can convert carbohydrates into glucose rapidly and therefore serve as a quick energy source. **Fats** are another source of energy for the body. The advantage of fat is the amount of energy contained in fat is much greater than the amount of energy stored in carbohydrates. Per gram, fats have a little more than twice the energy of carbohydrates. **Proteins** provide the body with the necessary materials to build muscle and other tissues for the body.



Part 1 – Plan Your Meal (50 minutes)

Materials

Materials for the whole class

- Hamburger Model
- Project BLM-1 “Hamburger Nutrition Label”
- Project BLM-2 “Nutrient Requirements for 11-14 year olds”

Materials for each student

- Student notebook

Preparation

Before this activity, select a few fast food restaurants for the students to plan their meal. Go to the websites of the restaurants and bookmark the pages with the nutritional information. This will be necessary when they analyze their meal.

Procedure

1. Pose a hypothetical scenario for the class. Inform students that they will be treated to lunch at any of the restaurants listed (provide a list for the students). Most students are familiar with the menus at various fast food restaurants. For students who are not familiar you may need to print menus from their website. In their notebooks, have students write down their entire order. Tell them that they are allowed to get food from different restaurants and remind them that you are treating.
2. Notebook Prompt. After all the meals have been planned, ask students to respond to these questions in their notebooks: “What does food do for our body?” “How do you think food is important for our health?”
3. Hold up the plastic hamburger and ask the students to speculate what foods or food groups are in the hamburger.
4. Spend some time discussing with the class the nutritional value of food. Be sure to discuss how food provides the energy and substances (carbohydrates, fats, and proteins) required for building materials, growth and survival of all organisms.
5. Project the nutritional label for the hamburger, Black Line Master-1 (BLM-1). Teachers should take the time to go over a nutrition label and ask students what kinds of information it contains. Answer any questions and point out things such as serving size. It is also an opportunity to talk about percent and how it is calculated.
6. Show the students the nutritional requirements of an 11-14 year-old (BLM-2) and compare it to the label for the burger. Ask students to share what they notice.



Part 2 – Analyze your meal (50 minutes)

Materials

Materials for the whole class

- Project BLM-2 “Nutrient Requirements for 11-14 year-olds”

Materials for each student

- Access to a computer with nutritional information bookmarked for the selected restaurants
- Copy of BLM-2 “Nutrient Requirements for 11-14 year-olds”
- Copy of BLM-3 “Nutritional Value of My Meal”
- Student notebook

Procedure

1. Hand out a copy of BLM-3 to each student. Inform the class that they will record the nutritional value of each item of the meal they chose. Each student will need access to a computer with nutritional information bookmarked for the selected restaurants. Be sure students include everything they typically eat when at a fast food restaurant including dipping sauces, free refills on soda, etc. All students must have completed the “Total” row of BLM-3 before moving to step 2.
2. Have students compare their results to the daily requirements, BLM-2. Be sure students calculate the percentage of the daily requirements of their meal.
3. Lead a class discussion about the results. Remind the class that they are evaluating the results of one meal compared to the total daily requirements. Often students will choose a meal that will exceed the daily requirements of several categories. Have students share the categories in which their meal contained 50% or greater than the daily requirement. Ask the students to share other things that were most interesting.

Part 3 – Balance the Equation (50 minutes)

Materials

Materials for the whole class

- Project Black Line Masters (BLM-4) “Calories Burned Chart”

Materials for each student

- Copy of BLM-2 “Nutrient Requirements for 11-14 year-olds”
- Copy of BLM-3 “Nutritional Value of My Meal”
- Student notebook



Procedure

1. Begin class by having students discuss the results of their meal and how they compared to the daily requirements. Ask students to report which nutritional categories exceeded the daily requirement. Also ask students to share where their meal contained 50% or more of the daily requirement.
2. At this point, ask students to think about what happens to the body if you exceed the total daily requirements. More importantly, how can we make healthier decisions to choose a more nutritious meal? Challenge students to consider how they could modify their meal so it is more in line with the nutritional guidelines.
3. Lunch challenge. Project BLM-2 and have students determine 30% of the daily nutritional requirements. Using this as a guide, have students plan a meal that would not exceed the requirements. Challenge them to plan a meal that they would eat!
4. Discuss their results and share observations.
5. Inform students that overall health is not just the foods you eat but also how your body uses the nutrients you consume. Exercise is crucial to maintaining a healthy body. Inform students that in addition to looking at what is in the foods we eat, we also need to look at how exercise should factor into the equation.
6. Ask students to predict how long they would need to walk to burn off 280 calories. Accept all answers. Inform the class that 280 calories is equivalent to the calories in a large soda (24 oz.).
7. Project BLM-4 and ask them to determine the answer. Most students will determine that it would take between 60-90 minutes. Remind students that people often refill their soda as they leave the restaurant because it's free.
8. Inform the students about the importance of exercise and "balancing the equation." If one consumes more energy than their body needs, they need to use the energy (exercise) or store the energy for later (fat). Discuss with the students the relationship between respiration and using energy.

To better understand the relationship of respiration and using energy, do the following:

1. Have each student count the number of breaths for 30 seconds as they sit still.
2. Have each student do 30 jumping jacks.
3. Immediately after, have each student count the number of breaths for 30 seconds.
4. Compare the number of breaths before and after.
Point out that each student just used more energy than if they remained still. The energy came from the food they consumed earlier in the day. Exercise results in more respiration and requires more energy.
9. Looking at BLM-4, ask students how they would plan to burn 500 or 700 calories per day if necessary.
10. Wrap-Up. Have students prepare an entire day of meals and exercise that would not exceed the nutritional guidelines.

Calories in Hamburger, Regular, Single Patty

With Condiments And Vegetables

Nutrition Facts

Serving Size 1 sandwich (110 g)

Per Serving	% Daily Value*
Calories 279	
Calories from Fat 122	
Total Fat 13.5g	21%
Saturated Fat 4.1g	20%
Polyunsaturated Fat 2.6g	
Monounsaturated Fat 5.3g	
Cholesterol 26mg	9%
Sodium 504mg	21%
Potassium 226.6mg	6%
Carbohydrates 27.3g	9%
Dietary Fiber 0g	0%
Sugars 0g	
Protein 12.9g	

Vitamin A 0% · Vitamin C 5%

Calcium 1% · Iron 83%

*Based on a 2000 calorie diet

Source:

<http://www.caloriecount.com/calories-hamburger-regular-single-patty-i21109>

DAILY ENERGY AND NUTRIENT REQUIREMENTS FOR 11 TO 14 YEAR-OLDS

	Calories	Total Fat	Sat. Fat	Protein	Carbs	Calcium	Sodium	Iron
Boys	2220	74.0 g	22.2 g	83.3 g	305.3 g	1000 mg	6 g	11.3 mg
Girls	1845	61.5 g	18.5 g	69.2 g	253.7 g	800 mg	6 g	14.8 mg

Calories Burned per 30 Minutes of Activity at Your Weight										
Activity Done for 30 Minutes at:	100 lbs	120 lbs	140 lbs	160 lbs	180 lbs	200 lbs	220 lbs	240 lbs	260 lbs	280 lbs
Aerobic Dancing	115	138	161	184	207	230	253	276	299	322
Aerobic Step Training	145	174	203	232	261	290	319	348	377	406
Backpacking (20 lb load)	200	240	280	320	360	400	440	480	520	560
Basketball	130	156	182	208	234	260	286	312	338	364
Bicycling	200	240	280	320	360	400	440	480	520	560
Dancing	100	120	140	160	180	200	220	240	260	280
Gardening	90	108	126	144	162	180	198	216	234	252
Golf, walking without cart	100	120	140	160	180	200	220	240	260	280
Housework	90	108	126	144	162	180	198	216	234	262
Jogging (5 mph)	185	222	259	296	333	370	407	444	481	518
Mowing	135	162	189	216	243	270	297	324	351	378
Skipping Rope	285	342	399	456	513	570	627	684	741	798
Stair Climber Machine	160	192	224	256	288	320	352	384	416	448
Swimming (25 yards per min)	120	144	168	192	216	240	264	288	312	336
Walking (15 minute mile)	100	120	140	160	180	200	220	240	260	280
Weight Training (90 seconds between sets)	125	150	175	200	225	250	275	300	325	350

Source:

<http://www.addictinginfo.org/wp-content/uploads/2014/08/caloriesperhourchart.gif>