

## Food Chemistry and Nutrition – Final Assessment

Directions: Read the questions carefully. Answer using complete sentences, specific examples and evidence.

<b>What is nutrition?</b>	<b>Are you on a diet? How do you know?</b>	<b>What's in food anyways?</b>	<b>How do living things get energy and nutrients?</b>	<b>How much am I supposed to eat?</b>
<b>What is a balanced diet?</b>	<b>What does it mean to be a healthy eater?</b>	<b>What's the difference between healthy and unhealthy food?</b>	<b>How can I make sure I'm getting what I need?</b>	

**Assessment Option 1 –Dietitian**

**Goal:**

The goal is to improve your client's fast food choices.

**Role:**

You are a dietitian at the local health clinic.

**Audience:**

The target audience is your client, Mr. Ayelub Burrger.

**Situation:**

You need to develop a plan that Mr. Ayelub Burrger can use when he visits his favorite fast food restaurant. The plan should help Mr. Ayelub Burrger should let him visit his favorite fast food restaurant and make healthier choices from the menu.

**Product Performance and Purpose:**

Step 1: You need to read over Mr. Burrger's favorite fast food meal.

Step 2: Then you need to go to the restaurant's website and find out how many calories and nutrients he is getting from his meal.

Step 3: Based on the information you gather, you need to decide whether Mr. Burrger's meal is healthy and how he can improve it.

Step 4: Finally, you need to go back to the restaurant's website and find another meal that Mr. Burrger can have that will make him happy and healthier.

**Standards and Criteria for Success:**

Your plan should...

- Tell Mr. Burrger about the nutritional content of his favorite meal
- Tell what is unhealthy about Mr. Burrger's favorite meal
- Provide Mr. Burrger with another meal that is healthier
- Tell Mr. Burrger why the new meal is better for his health
- Contain correct spelling, grammar, and punctuation

**Materials:** Mr. Burrger's fast food diary page, data sheet, computer with Internet access, calculator, pencil, paper

Action Plan for Mr. Ayelub Burrger

**Mr. Ayelub Burrger’s Fast Food Diary  
Entry Number 345**

*I just love McDonald’s! Today when I visited I had my favorite meal – a Number 1 Combo.*

*Big Mac  
Large Fries  
Large Coke*

**Goal: To choose healthier menu items when visiting your favorite fast food restaurant**

Mr. Ayelub Burrger  
Daily Goals:  
2,400 calories  
50 grams of total fat

Go to <http://nutrition.mcdonalds.com/bagamcmeal/bagMeal.do> to find out how many calories and nutrients Mr. Burrger consumed. Then, fill in the data chart below.

Calories	Total Fat(g)	Saturated Fat(g)	Carbohydrates(g)	Protein(g)
	Multiply x 9		Multiply x 4	Multiply x 4

Is this meal healthy? Why or why not?

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Does his meal contain a variety of food groups? How do you know?

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## Action Plan for Mr. Ayelub Burrger – Page 2

**Goal: To choose healthier menu items when visiting your favorite fast food restaurant**

**Step 1:** Copy the nutritional information for Mr. Burrger’s favorite meal below.

**Step 2:** Go to <http://nutrition.mcdonalds.com/bagamcmeal/bagMeal.do> to find a healthier meal. Then, fill in the data chart below with the nutrition information for the new meal.

<b>Old Meal</b>	<b>Nutrition Information for the Entire Meal</b>	<b>New, Healthier Meal</b>	<b>Nutrition Information for the Entire Meal</b>
Sandwich: <i>Big Mac</i>	Total Calories _____	Sandwich:	Total Calories _____
Side Item: <i>Large Fries</i>	Total Fat(g) _____	Side Item:	Total Fat(g) _____
Drink: <i>Large Coke</i>	Total Carbohydrates(g) _____	Drink:	Total Carbohydrates(g) _____
Dessert: <i>Hot Fudge Sundae</i>	Total Protein(g) _____	Dessert:	Total Protein(g) _____

**Why is the new meal healthier for Mr. Burrger? Be specific and give at least three examples.**

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## Assessment Option 2 – Food Scientist

**Goal:**

The goal is to improve the nutritional value of a favorite snack food.

**Role:**

You are a food scientist at a local university.

**Audience:**

The target audience is the consumer and the producer of a favorite snack food.

**Situation:**

You need to analyze and evaluate the nutritional content and ingredients of a favorite snack food and develop a proposal on three ways that you can improve it. The proposal should help the producer provide a healthier, more nutritious snack to the consumer.

**Product Performance and Purpose:**

Step 1: You need to analyze and evaluate the nutrition label and recipe of the snack food.

Step 2: Then you need to decide on three ways that the nutritional content of the food can be improved.

Step 3: Finally, you need to tell the producer why making the changes would improve the snack and make it better for consumers.

You may also wish to create a new nutrition label and recipe based on the changes you proposed.

**Standards and Criteria for Success:**

Your proposal should...

- Tell the producer your findings after analyze and evaluating the nutrition label
- Give the producer two ways to improve the nutritional content of the food
- Tell the producer how making the changes would make the food better for consumers
- Contain correct spelling, grammar, and punctuation

You could include...

- A revised nutrition label
- An updated recipe
- New product packaging

**Materials:** Recipe for favorite snack food, calculator, data sheet, tip sheet

## Recipe for Chocolate Chip Cookies

### Chocolate Chip Cookies

Prep Time: 10 Minutes  
Cook Time: 15 Minutes

Ready In: 40 Minutes  
Yields: 18 servings

#### INGREDIENTS:

2 cups all-purpose flour	1/2 cup white sugar
1/2 teaspoon baking soda	1 tablespoon vanilla extract
1/2 teaspoon salt	1 egg
3/4 cup unsalted butter, melted	1 egg yolk
1 cup packed brown sugar	2 cups semisweet chocolate chips

#### DIRECTIONS:

Preheat the oven to 325 degrees F (165 degrees C). Grease cookie sheets or line with parchment paper.

In a medium bowl, cream together the melted butter, brown sugar and white sugar until well blended. Beat in the vanilla, egg, and egg yolk until light and creamy.

Mix in the sifted ingredients until just blended. Stir in the chocolate chips by hand using a wooden spoon. Drop cookie dough 1/4 cup at a time onto the prepared cookie sheets. Cookies should be about 3 inches apart.

Bake for 15 to 17 minutes in the preheated oven, or until the edges are lightly toasted. Cool on baking sheets for a few minutes before transferring to wire racks to cool completely.

### Nutrition Information

Serving Size	1 cookie
Servings Per Recipe	18
<hr/>	
Amount Per Serving	
Calories	285
Calories from Fat	126
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	% Daily Value *
Total Fat 14g	21 %
Saturated Fat 8.3g	41 %
Cholesterol 44mg	15 %
Sodium 112mg	4 %
Potassium 133mg	4 %
Total Carbohydrates 40g	13 %
Dietary Fiber 1.5g	6 %
Protein 2.8g	6 %

Sugars 28.4g	
Vitamin A	7 %
Vitamin C	0 %
Calcium	3 %
Iron	16 %
Thiamin	12 %
Niacin	8 %
Vitamin B6	1 %
Magnesium	10 %
Folate	14 %

### Making Chocolate Chip Cookies Healthier – Data Sheet

Step 1: Read over the recipe.

Question: Is this cookie healthy and nutritionally balanced? Why or why not?

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Step 2: Read over the article “Ways to Make Recipes Healthier”.

Step 3: Choose three ingredients to change or add in the recipe in order to make it better. Write them in the boxes below and answer the questions.

<p><b>Ingredient:</b></p> <p><b>Why are you changing this ingredient?</b></p> <p><b>What are you changing the ingredient to?</b></p> <p><b>How will this change make the food healthier?</b></p>	<p><b>Ingredient:</b></p> <p><b>Why are you changing this ingredient?</b></p> <p><b>What are you changing the ingredient to?</b></p> <p><b>How will this change make the food healthier?</b></p>	<p><b>Ingredient:</b></p> <p><b>Why are you changing this ingredient?</b></p> <p><b>What are you changing the ingredient to?</b></p> <p><b>How will this change make the food healthier?</b></p>
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On the back of this sheet, write a short note to the producer explaining how the changes you have made will help the producer provide a healthier, more nutritious snack for the consumer.

## Ways to Make Recipes Healthier

### 1. Reduce the amount of fat, sugar and sodium

With most recipes, you can reduce the amount of fat, sugar and sodium without losing the flavor. By cutting fat and sugar, you also cut calories. How much can you leave out without affecting the flavor and consistency of the food? Apply the following general guidelines:

- **Fat.** For baked goods, use half the butter, shortening or oil and replace the other half with unsweetened applesauce, mashed banana or prune puree. You can also use commercially prepared fruit-based fat replacers found in the baking aisle of your local grocery store.
- **Sugar.** Reduce the amount of sugar by one-third to one-half. When you use less sugar, add spices such as cinnamon, cloves, allspice and nutmeg or flavorings such as vanilla extract or almond flavoring to enhance the sweetness of the food.
- **Sodium.** Reduce salt by one-half in baked goods that don't require yeast. For foods that require yeast, don't reduce the amount of salt, which is necessary for leavening. Without salt, the foods may become dense and flat. For most main dishes, salads, soups and other foods, however, you can reduce the salt by one-half or eliminate it completely.

Other ingredients may contain sugar, fat and sodium, and you can decrease them as well. For example, if the recipe calls for 1 cup shredded cheddar cheese, use 1/2 cup instead. Or use less soy sauce than is indicated to decrease the amount of sodium in the food.

## 2. Make a healthy substitution

Healthy substitutions not only reduce the amount of fat, calories and sodium in your recipes, but also can boost the nutritional content. For example, use whole-wheat pasta in place of enriched pasta. You'll triple the fiber and reduce the number of calories. Prepare a dessert with fat-free milk instead of whole milk to save 63 calories and almost 8 grams of fat per cup.

## 3. Delete an ingredient

In some recipes, you can delete an ingredient altogether; likely candidates include items you add out of habit or for appearance, such as frosting, coconut or nuts, which are high in fat and calories. Other possibilities include optional condiments, such as pickles, olives, butter, mayonnaise, syrup, jelly and mustard, which can have large amounts of sodium, sugar, fat and calories.

## 4. Change the method of preparation

Healthy cooking techniques — such as braising, broiling, grilling and steaming — can capture the flavor and nutrients of your food without adding excessive amounts of fat, oil or sodium. If your recipe calls for frying the ingredients in oil or butter, try baking, broiling or poaching the food instead. If the directions say to baste the meat or vegetables in oil or drippings, use wine, fruit juice, vegetable juice or fat-free vegetable broth instead. Using nonstick pans or spraying pans with nonstick cooking spray will further reduce the amount of fat and calories added to your meals.

## 5. Change the portion size

No matter how much you reduce, switch or omit ingredients, some recipes may still be high in sugar, fat or salt. In these cases, reduce the amount of that food you eat. Smaller portions have less fat, calories and sodium and allow you to eat a wider variety of foods during a meal. Eating a variety of foods will ensure that you get all the energy, protein, vitamins, minerals and fiber you need.

## Putting it all together

As you look over your recipe, decide what to change and how to change it. Make notes of any alterations, so you can refer to them the next time you prepare the food. You may have to make the recipe a few times, adjusting your alterations, before you get the results you want. But finding the right combination of ingredients — for the desired taste, consistency and nutrients — is well worth the trouble.



## Fat and cholesterol

### To reduce the amount of fat and cholesterol

If your recipe calls for:	Try substituting:
Bacon	Canadian bacon, turkey bacon, smoked turkey or lean prosciutto (Italian ham)
Butter, margarine, shortening or oil in baked goods	Applesauce or prune puree for half of the called-for butter, shortening or oil Note: To avoid dense, soggy or flat baked goods, don't substitute oil for butter or shortening, and don't substitute diet, whipped or tub-style margarine for regular margarine.
Butter, margarine, shortening or oil to prevent sticking	Cooking spray or nonstick pans
Creamed soups	Fat-free milk-based soups, mashed potato flakes, or pureed carrots, potatoes or tofu for thickening agents
Eggs	Two egg whites or 1/4 cup egg substitute for each whole egg
Evaporated milk	Evaporated skim milk
Full-fat cream cheese	Fat-free or low-fat cream cheese, Neufchatel or low-fat cottage cheese pureed until smooth
Full-fat sour cream	Fat-free plain yogurt, or fat-free or low-fat sour cream
Ground beef	Extra-lean or lean ground beef, chicken or turkey
Mayonnaise	Reduced-calorie mayonnaise-type salad dressing or reduced-calorie, reduced-fat mayonnaise
Oil-based marinades	Wine, balsamic vinegar, fruit juice or fat-free broth
Salad dressing	Fat-free or reduced-calorie dressing or flavored vinegars
Whole milk	Reduced-fat or fat-free milk

## Sodium

### To reduce the amount of sodium

If your recipe calls for:	Try substituting:
Seasoning salt, such as garlic salt, celery salt or onion salt	Herb-only seasonings, such as garlic powder, celery seed or onion flakes, or use finely chopped garlic, celery or onions
Soups, sauces, dressings, crackers, or canned meat, fish or vegetables	Low-sodium or reduced-sodium versions
Soy sauce	Sweet-and-sour sauce, hot mustard sauce or low-sodium soy sauce
Table salt	Herbs, spices, fruit juices or salt-free seasoning mixes or herb blends

## Sugar

### To reduce the amount of sugar

If your recipe calls for:	Try substituting:
Fruit canned in heavy syrup	Fruit canned in its own juices or in water, or fresh fruit
Fruit-flavored yogurt	Plain yogurt with fresh fruit slices
Syrup	Pureed fruit, such as applesauce, or low-calorie, sugar-free syrup

## Other nutrients

To increase the amount of nutrients, including vitamins, minerals and fiber

If your recipe calls for:	Try substituting:
All-purpose (plain) flour	Whole-wheat flour for half of the called-for all-purpose flour
Dry bread crumbs	Rolled oats or crushed bran cereal
Enriched pasta	Whole-wheat pasta
Iceberg lettuce	Arugula, chicory, collard greens, dandelion greens, kale, mustard greens, spinach or watercress
Meat as the main ingredient	Three times as many vegetables as the meat on pizzas or in casseroles, soups and stews
White bread	Whole-wheat bread
White rice	Brown rice, wild rice, bulgur or pearl barley

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## Assessment Option 3 – Advertising

**Goal:**

The goal is to inform and persuade consumers to eat foods rich in vitamins and minerals.

**Role:**

You are an advertiser for a local farmer's market.

**Audience:**

The target audience is the consumer.

**Situation:**

You need to review information about the six most important vitamins and minerals and create a brochure that gives information about vitamins and minerals. The brochure should help the consumer understand the advantages, disadvantages, and sources of each vitamin and mineral.

**Product Performance and Purpose:**

Step 1: You need to review the information provided about the ten most important vitamins and minerals.

Step 2: Then, you need to choose 3 vitamins and 3 minerals you think the consumer should know about.

Step 3: Next, take notes on the advantages, disadvantages, foods, and recommended amounts for each vitamin or mineral.

Step 4: Finally, you create a brochure that informs about the six most important vitamins and mineral.

**Standards and Criteria for Success:**

Your brochure should...

- Tell the consumer the advantages and disadvantages of each vitamin and mineral
- Give consumers ideas of foods to eat that contain the vitamins and minerals
- Tell consumers how much of each vitamin and mineral they should consume
- Contain correct spelling, grammar, and punctuation

**Materials:** Brochure template, Nonfiction passage on vitamins and minerals, crayons or colored pencils, pencils, planning sheet, computer with Internet access OR information on vitamins and minerals

# Brochure Template

Food Sources	Recommended Amounts	Mineral Advantages	Disadvantages	Food Sources	Recommended Amounts
Illustration:			Author Information:		
Front Cover Art			Title and Author		

# Brochure Template

## Vitamins and Minerals Planning Sheet

Vitamin Advantages	Food Sources	Mineral Advantages
Disadvantages	Recommended Amounts	Disadvantages
Food Sources	Vitamin Advantages	Food Sources
Recommended Amounts	Disadvantages	Recommended Amounts
Minerals Advantages	Food Sources	Vitamin Advantages
Disadvantages	Recommended Amounts	Disadvantages

**Step 1: Read the article “The Ten Most Essential Vitamins and Minerals”.**

**Step 2: Choose three vitamins and three minerals.**

**Step 3: Find information on each vitamin or mineral and enter it in the graphic organizer below.**

	<b>Vitamin 1</b>	<b>Mineral 1</b>	<b>Vitamin 2</b>	<b>Mineral 2</b>	<b>Vitamin 3</b>	<b>Mineral 3</b>
<b>Name:</b>						
What happens if you take in just enough? (Advantages)						
What happens if you take too much? (Disadvantages)						
Food Sources						
Recommended Amounts						

**Step 4: Turn your notes into sentences and fill-in your brochure template.**

**Step 5: Make sure your brochure is attractive and colorful, and free of spelling, grammar, and punctuation mistakes.**

## The 10 Most Essential Vitamins and Minerals

There is an information overload on vitamins and minerals to be included in a healthy diet. It is often difficult to determine what is necessary and what is optional from the choices you have.

### Here are the 10 most important Vitamins and Minerals your body needs:

1. Iron (mineral) - Fortified cereals, whole grains, dried fruits, nuts and seeds are important sources of iron. Red meat is also rich in iron but it should be taken only three servings per week. Combination of these iron supplements with ingredients high in Vitamin C will help your body absorb the iron properly.
2. Vitamin D - Deficiency leads to rickets in children, and osteoporosis and other diseases in Adults. Vitamin D is very necessary for Cancer prevention. Good sources are vitamin D-fortified milk and milk substitutes, fatty fish such as salmon, and vitamin D-fortified yogurt.
3. Calcium (mineral) - Along with Vitamin D, is necessary for bone health. Milk, fortified soy milk, dairy products, almonds, beans, sesame seeds and broccoli are Calcium rich food.
4. Selenium (mineral) - It is a lesser known mineral but it is never the less important. It supports the immune system, reduces inflammation and helps protect from cancer. Sunflower seeds, fish, shellfish, red meat and one Brazil nut daily will give you enough selenium.
5. Vitamin C - This is an antioxidant vitamin that is believed to protect the brain from damage caused by Alzheimer. It helps you to tackle stress better and also protects you from common cold. A glass of Orange juice, citrus fruits, bell peppers, kiwifruit, papaya, broccoli, dark leafy greens and strawberries will provide you Vitamin C.
6. Vitamin K – This vitamin plays an important role to strengthen the bones, avoid blood clotting and prevent hardening of arteries. Dark, leafy vegetables are good source of Vitamin K.
7. Folate (vitamin) – It reduces risk of Alzheimer. It is good for pregnant women as it reduces the risk of having babies with neural tube defects. Spinach helps you get folate. Other sources are beans, peanuts, broccoli, corn, lentils and oranges.
8. Vitamin E fights – This is another antioxidant that reduces risk of heart disease, stroke and Alzheimer. Daily intake of nuts and seeds such as almonds and sunflower seeds will provide you Vitamin E.

9. Magnesium (mineral) - It helps build strong bones and lower risk of diabetes by enhancing the action of insulin in your body. Beans, nuts, seeds and green vegetables such as spinach are great sources of Magnesium.
10. Potassium (mineral) - Helps to maintain blood pressure. It also helps reduce your risk of stroke. Beans, potatoes, sweet potatoes, bananas, dried fruits, winter squash, cantaloupe, kiwi, orange juice, prune juice and avocados are good sources of Potassium.

Visit the following website for additional information on the ten most essential vitamins and minerals:

*National Institutes of Health: Vitamin and Mineral Fact Sheets*

[http://ods.od.nih.gov/Health\\_Information/Vitamin\\_and\\_Mineral\\_Supplement\\_Fact\\_Sheets.aspx](http://ods.od.nih.gov/Health_Information/Vitamin_and_Mineral_Supplement_Fact_Sheets.aspx)



## Assessment Option 4 – Chef

### Goal:

The goal is to create a tasty and nutritionally balanced menu for the Happy Feet Day Camp.

### Role:

You are a chef for the Happy Feet Camp Corporation

### Audience:

Campers at the day camp

### Situation:

You need to design a menu for one day, including three main meals and two snacks, using the USDA My Plate guidelines for children. The menu should include a letter to parents explaining how the menu is healthy and nutritious for the campers.

### Product Performance and Purpose:

Step 1 – You need to find out the My Plate guidelines for children or use your own as a reference.

Step 2 – Then, you need to plan three meals and two snacks using the guidelines.

Step 3 – Next, you need to create a chart showing the fat, protein, carbohydrates, and calories for the meals on the menu.

Step 4 – Finally, you need to write a letter to the parents explaining how your menu meets the My Plate guidelines.

### Standards and Criteria for Success:

Your menu should...

- Meet My Plate guidelines
- Have three meals and two snacks
- Contain a chart showing nutrients and calories for each meal

Your letter should...

- Accurately explain how your menu is nutritionally balanced and tasty
- Be in proper friendly letter format
- Contain correct, spelling, grammar, and punctuation

### Materials:

- menu planning sheet
- computer with internet access
- paper, pencils, crayons, or colored pencils

## Menu Planning Sheet

**Purpose: Tasty and nutritionally balanced menu for Happy Feet Day Camp**

*Information about the campers at the 3<sup>rd</sup> Annual Happy Feet Day Camp*

- 20 boys
- Average age of 10
- Average weight of 90 pounds
- Average height of 4 feet 6 inches
- Average physical activity of 30-60 minutes a day

**Step 1:** Visit the My Plate website to get the guidelines for the campers at the Happy Feet Day

*My Plate plan for a boy, age 10, 90 pounds, 4 feet 6 inches tall, with 30-60 minutes of activity a day*

Calories: \_\_\_\_\_

Grains: \_\_\_\_\_

Oils: \_\_\_\_\_

Vegetables: \_\_\_\_\_

Protein Foods: \_\_\_\_\_

Fruits: \_\_\_\_\_

Dairy: \_\_\_\_\_

Camp. Use the information in the text box above to help you.

<http://www.choosemyplate.gov/supertracker-tools/daily-food-plans.html>

**Step 2:** Using the My Plate plan, create a menu for the campers

<b>Breakfast</b>	Main dish:	<b>Lunch</b>	Main dish:
	Side item:		Side item:
	Side item:		Side item:
	Drink:		Drink:
	Other:		Other:
<b>Dinner</b>	Main dish:	<b>Snack 1</b>	
	Side item:		

	Side item: Drink: Other:	<b>Snack 2</b>	
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**Step 3:** Make a tally chart to keep track of the number of servings the menu you've created has for each food group. Compare the number of servings you have for each food group to the number the boys are SUPPOSED to have.

Grains	Fruits	VEGETABLES	DAIRY	PROTEIN FOODS	OILS	EMPTY CALORIES AND HIGH FAT
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Do you have enough? Write a balanced equation for each food group below. Example: 2 ½ fruits x 1 serving = 2 ½ servings

Grains	Fruits	VEGETABLES	DAIRY	PROTEIN FOODS	OILS	EMPTY CALORIES AND HIGH FAT
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**Step 4:** Use calorie calculators to estimate the number of calories, total fat, carbohydrates, and protein found in each meal.

Meal	Items	Calories	Fat	Carbohydrates	Protein
Breakfast	Main dish: Side item: Side item: Drink: Other:				
Dinner	Main dish: Side item: Side item: Drink: Other:				
Lunch	Main dish: Side item: Side item: Drink: Other:				

Snack 1					
Snack 2					

**Step 5:** Use the paper, pencils, and crayons to make the menu for the day. Make sure it is colorful, attractive, and has correct spelling, punctuation, and capitalization.

**Step 6:** Write a friendly letter to the parents of the campers explaining how the menu is tasty and nutritionally balanced.

Use the space below for planning or working out problems.