



■ NUTRITION

Nutrition has several meanings. One common meaning is that nutrition is the process by which nutrients are taken in and used by the body for growth, repair, and overall health. Another meaning, and the one that is the topic of this section, is that nutrition is the study of how food affects the health of the human body.

Perhaps students have only thought about food as something that they need when they feel hungry, and that the purpose of food is to make hunger go away. However, food has more than just the power to satisfy hunger. Food is important because of its content. For example, a piece of pizza might be made up of bread, tomato sauce,

cheese, mushrooms, and peppers. To understand the importance of the pizza as food, students can look at the process used to make the food — the making of the bread with flour, water, and yeast, the making of the tomato sauce with tomatoes and seasonings — and at the production of the ingredients — the growing of the tomatoes and peppers, and so on.

However, thinking about nutrition also means looking beyond process and production and asking questions like this: “What does a tomato contribute to the body? What does cheese contribute?” This is the level at which an understanding of nutrition begins.

Background Information

This section introducing students to nutrition looks at five topics: nutrients, food guides, calories, nutrition labels, and food and cooking vocabulary.

Nutrients

Food is made up of nutrients that are important for the body. Nutrients are found in food in varying degrees, depending on the type of food. Six basic nutrients are carbohydrates, proteins, fats, water, vitamins, and minerals:

- **Carbohydrates** are food substances that provide the body with energy. Sugar, starch, and fiber are all carbohydrates. Some examples of foods that contain carbohydrates are potatoes, grains, and beans.
- **Proteins** are food substances that are responsible for growth and repair in the body. Some examples of foods that contain protein are meat, fish, tofu, and dairy products.
- **Fats** are food substances that supply the body with energy, provide a cushioning layer around organs, and insulate the body from very hot and cold temperatures. **Nutritionists**, people who study nutrition, currently believe that some fats can be eaten without harm to the body and some cannot. According to many nutritionists, less harmful fats are found in foods like olive oil, walnuts, and fish. Other fats, when consumed in large quantity, can clog arteries and cause problems in the cardiovascular system. These fats are found in foods like butter, cheese, and meat. Since foods like

butter, cheese, and meat contain other important nutrients, many nutritionists recommend that people balance their intake of foods, eating less harmful fats as often or more often than possibly harmful fats.

- **Water** is a clear, colorless liquid that is the main component of all the fluids in the body, including blood, digestive juices, sweat, urine, and tears. The human body is more than one-half water. Water is crucial for good health and for survival — water helps to keep things moving through the digestive system, controls the body's temperature, and lubricates the body's joints.
- **Vitamins and minerals** are substances required in very small but vital amounts to promote and maintain good health. Many vitamins and minerals are found in food, but some vitamins and minerals can be produced in the body and some can be made in factories and taken in capsule form. An example of a common vitamin is vitamin C, which is found in oranges and strawberries. An example of a common mineral is calcium, which is found in milk and other dairy products.

Vitamins and minerals are often referred to as **micronutrients** because they are required in small (micro) amounts to promote and maintain good health. Carbohydrates, protein, fat, and water are often referred to as **macronutrients** because they are required in large (macro) quantities to promote and maintain good health.

Food guides

While it is important for people to have an understanding of nutrients, it could be very time-consuming to analyze every food to decide whether it nourishes the body, and if so, in what quantity it is needed by the body for good health. Instead, many people refer to a **national food guide** — a country-specific guide to the kinds and quantities of foods required for good nutrition. Most guides recommend that every day, people choose from each of these food groups to obtain the nutrients they need for good nutrition: fruits, vegetables, meat and meat alternatives, milk and milk alternatives, and grains and grain products.

In North America, the national food guides are visual representations. In the US, a pyramid called MyPyramid represents US food guidelines. In Canada, a rainbow called Canada's Food Guide to Healthy Eating represents Canadian food guidelines. By following a national food guide, people can be assured that their bodies are receiving everything they need from their **diet**, the common daily intake of food. A **balanced diet** consists of a variety of nutritious food eaten every day, in the amount that each person's body needs to maintain good health. An **unbalanced diet** consists of an imbalance in the type or amount of food eaten every day and over time can lead to poor health.

The US and Canada provide interesting and informative websites about their national food guides:

- US National Food Guide.
<<http://www.mypyramid.gov/pyramid/index.html>>

- Canadian National Food Guide.
<http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/fg_rainbow-arc_en_ciel_ga_e.html>

Calories

Food provides people with energy, the capacity and strength to take some kind of action, whether mental or physical. The units of measurement for the energy provided by food are **calories**. Calories provide people with the vital energy they need to complete their daily activities, which include everything from the body's processes (pumping blood, breathing, digestion, etc.) to physical activities such as running, jumping, cleaning, dancing, and playing sports.

While all foods contain calories, some foods contain more calories than others. Foods that contain a high number of calories are not usually essential for good nutrition. Foods not essential for good nutrition fall into the category that is listed in the US national food guide as **discretionary calories** and in the Canadian national food guide as **other foods**. Foods not essential for good nutrition usually contain high amounts of calories in the form of sugar or fat and include such items as desserts, candy, soda, and alcohol. People who eat too many items from this category can easily get all of the calories they need in a day — and more — but not receive the nutrients they need for growth, repair, and overall health.

The daily number of calories each person needs depends on age, sex, height, weight, and level of physical activity. For example, MyPyramid recommends 1400 calories per

day for girls ages 6–8 who have 30–60 minutes of physical exercise a day, and 1600 calories per day for boys. (MyPyramid does not take height and weight into account.) Over time, consuming more calories than needed and not adding physical activity to use the extra energy provided by the calories might cause a person to gain excess weight. On the other hand, not consuming enough calories might cause a person to lose excess weight. In both cases, the person might feel tired, develop health problems, and in extreme cases not be able to perform regular activities.

Nutrition labels

Another helpful resource when trying to make healthy food choices is the **nutrition label** that appears on packaged foods and provides information such as the serving size, number of calories, and amounts of carbohydrates, protein, fat, and **sodium** (common name salt), a naturally occurring substance that is found in mineral deposits and sea water and in small amounts helps the body's cells function properly. This information is important for people trying to maintain a balanced diet. For example, while a small amount of salt each day is important for good health, too much salt can interfere with the body's systems and create poor health.

The most important information on the nutrition label is the serving size. Without it, the other information on the label would not be of much use because the nutrition information is based on one serving. A bag of potato chips may contain what the manufacturer considers to be one, two, or even ten servings. A person would not want

to eat the whole bag only to find out that the 90 calories mentioned on the nutrition label is for only one of the ten servings contained in the bag. That would mean the person had just consumed 900 calories! Often, a serving size according to the manufacturer (perhaps five or six chips) may be quite different from what someone else might consider a serving size (perhaps 12 or 14 chips).

Note to the teacher

While all information contained on a nutrition label is important — especially the fat and sodium content — this manual focuses on introducing the nutrition label and the concept of serving size to students. The list of ingredients on packaged foods is also important, but beyond the scope of this manual. Students will study ingredients labels along with other aspects of the nutrition label in upper elementary.

Nutrition Facts	
Valeur Nutritive	
Per 1 slice (38 g)	
Pour 1 tranche (38 g)	
Amount	% Daily Value
Teneur	% valeur quotidienne
Calories/Calories 90	
Fat/Lipids 1 g	2%
Saturated/saturés 0 g	
Trans/trans 0 g	0%
Polyunsaturated/polyinsaturés 0.4g	
Omega-6/oméga-6 0.3 g	
Omega-3/oméga-3 0 g	
Monounsaturated/monoinsaturés 0.3g	
Cholesterol/Cholestérol 0 mg	
Sodium/Sodium 160mg	7%
Potassium/Potassium 60 mg	2%
Carbohydrate/Glucides 14 g	5%
Fibre/Fibres 3 g	12%
Soluble Fibre/Fibres solubles 1 g	
Insoluble Fibre/Fibres insolubles 2 g	
Sugars/Sucres 1 g	
Protein/Protéines 5 g	
Vitamin A/Vitamine A	0%
Vitamin C/Vitamine C	0%
Calcium/Calcium	2%
Iron/Fer	6%
Thaimine/Thiamine	6%
Riboflavin/Riboflavine	2%
Niacin/Niacine	6%
Folate/Folate	4%
Phosphorous/Phosphore	6%
Magnesium/Magnésium	10%
Zinc/Zinc	8%

Food and cooking vocabulary

Students can investigate nutrition through the topics discussed so far in this section: learning about nutrients, becoming familiar with food guides, becoming aware of calories, and reading nutrition labels. The final topic to be discussed in this section is the development of a **food vocabulary**, a set of words associated with food, and a **cooking vocabulary**, a set of words associated with the preparation of food for eating.

Lower elementary students usually appreciate new words and enjoy learning unusual ones. A food vocabulary can include foods from all over the world and inspire students to investigate not only where particular foods come from, but also how they are prepared. A cooking vocabulary can help students feel confident when doing cooking activities and be aware that food can be prepared in many different ways.

A food vocabulary chart and a cooking vocabulary chart are provided in the following sections. Teachers can use these charts as sources of information for introducing the concepts of food and cooking vocabularies to students. Students will enjoy contributing words from their own experience and that of their families. Teachers can also provide a cookbook (ideally with illustrations) so that students can look up words and terms that are unfamiliar.



Food vocabulary chart

Fruits	Vegetables	Meat and meat alternatives	Milk and milk alternatives	Grains and grain products
Apple, apricot, banana, blueberry, cantaloupe, cherry, cranberry, grapes, grapefruit, guava, honeydew, kumquat, lemon, orange, papaya, peach, pear, persimmon, pineapple, plum, raspberry, rhubarb, strawberry, tomato, watermelon	Artichoke, asparagus, beans, beet, broccoli, cabbage, carrot, cauliflower, celery, chard, collard greens, corn, cucumber, garlic, lettuce, mushroom, onion, peas, pepper, potato, pumpkin, radish, spinach, squash, sweet potato, turnip, yam, zucchini	Bacon, beef, chicken, deer, dried peas and beans, duck, eggs, fish, goose, ham, lamb, lentils, miso, moose, mutton, nuts, peanut butter, pheasant, pork, poultry, tofu, turkey	Butter, cheese (hard and soft), cow's milk, cream, goat's milk, ice cream, milkshakes, puddings, rice milk, soymilk, yogurt	Bagels, barley, basmati rice, bran, bread, brown rice, buckwheat, cereal, corn, millet, muffins, oats, pancakes, pasta, pita, quinoa, rolls, rye, sorghum, tortillas, waffles, wheat, white rice



Cooking vocabulary chart

Cooking methods	Cooking utensils	Measurements
Add, bake, beat, blend, boil, broil, chop, cream, crush, cut, decorate, dice, drain, drop, fold, grate, grill, knead, mash, measure, mince, mix, mold, pour, roll, scoop, scrape, shake, shape, sieve, slice, slit, spread, sprinkle, stir, toss, trim, whisk	Baking dish, beaters, blender, bowl, chopsticks, cookie sheet, cooling rack, cutting board, egg lifter, fork, fry pan, garlic crusher, grater, grinder, jug, knife, measuring cup, muffin pan, peeler, pie dish, rolling pin, saucepan, spatula, spoon, tongs, whisk, wooden spoon	Cup, gram, kilogram, liter, milliliter, ounce, pound, pinch, scale, sprinkle, tablespoon, teaspoon

Resources

There are many excellent resources on topics related to nutrition. Here are some examples:

- Haduch, Bill. *Food Rules: The Stuff You Munch, Its Crunch, Its Punch, and Why You Sometimes Lose Your Lunch!* New York, NY: Dutton, 2001.
- Thompson, Colleen. *Overcoming Childhood Obesity*. Boulder, CO: Bull Publishing Company, 2003.
- VanCleave, Janice. *Janice VanCleave's Food and Nutrition for Every Kid*. New York, NY: John Wiley and Sons, 1999.
- Calorie Control Council (US). <www.caloriecontrol.org>
- Childhood Overweight. <<http://www.cdc.gov/HealthyYouth/obesity/index.htm>>
- KidsHealth (three sections provide information and activities aimed at parents, teens, and children): Food Labels. <www.kidshealth.org/parent/nutr>
- Nutritional information for popular fast food restaurants. <<http://www.nutritiondata.com/>> and <<http://www.fatcalories.com/>>
- Obesity in Youth. <http://www.obesity.org/subs/fastfacts/obesity_youth.shtml>
- World Health Organization. <<http://www.who.int/nutrition/en/>>

- Discovery School. Daily Planet: The Science of Obesity. Discovery Education, producer. Silver Spring, MD: Discovery Communications, Inc., 2005. 30 min. DVD.

Did you know?

- Studies show that about one-third of the people in Canada and the US are **obese**, commonly defined as being 20 percent over the average body weight for people the same sex, height, and age. According to nutritionists, the increasing number of adults and children who are considered obese is due to several factors, including unbalanced diets, unnecessarily large serving sizes of food, and too little exercise.
- While in some countries many people are obese, in other countries many people are **malnourished**, meaning that on a long-term basis they do not receive food that provides enough nutrition.
- Malnourishment can lead to chronic diseases and early death. Obese people can also be malnourished because they often do not get the correct nutrients from their diets. World health agencies are discovering increases in malnutrition due to obesity.



ACTIVITY 1

Discovering the Nutrients in Food

Purpose

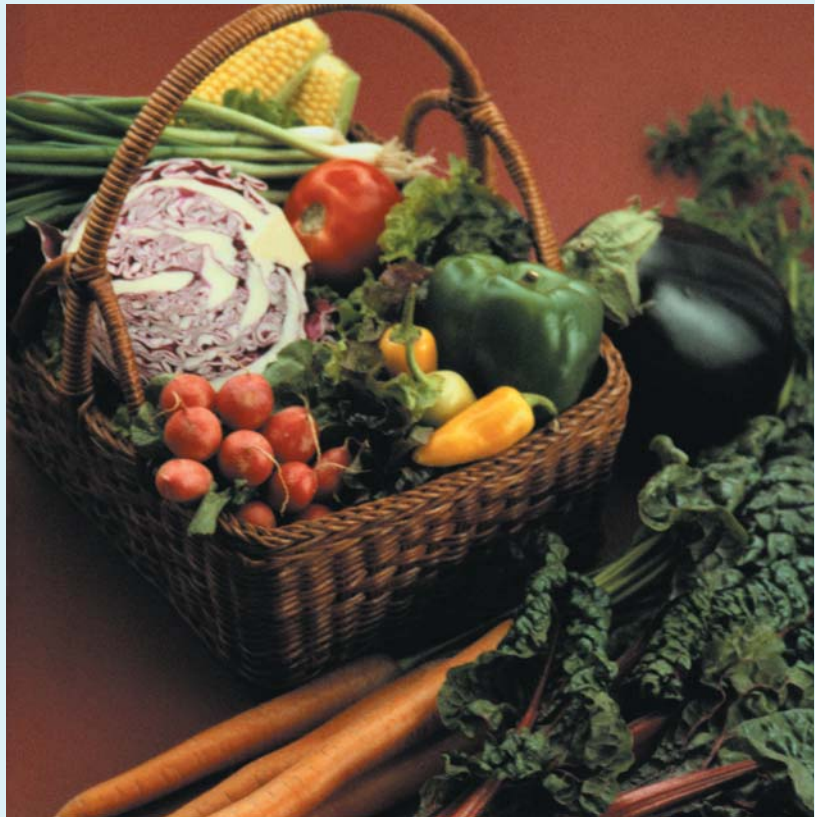
To begin looking at food as a source of nutrients.

Material

Samples of foods that contain the four main macronutrients: carbohydrates (e.g., bread, rice, pasta), fat (e.g., olive oil, cheese, butter), protein (e.g., tin of tuna, boiled egg, yogurt), and water.

Samples of micronutrients (vitamin and mineral supplements).

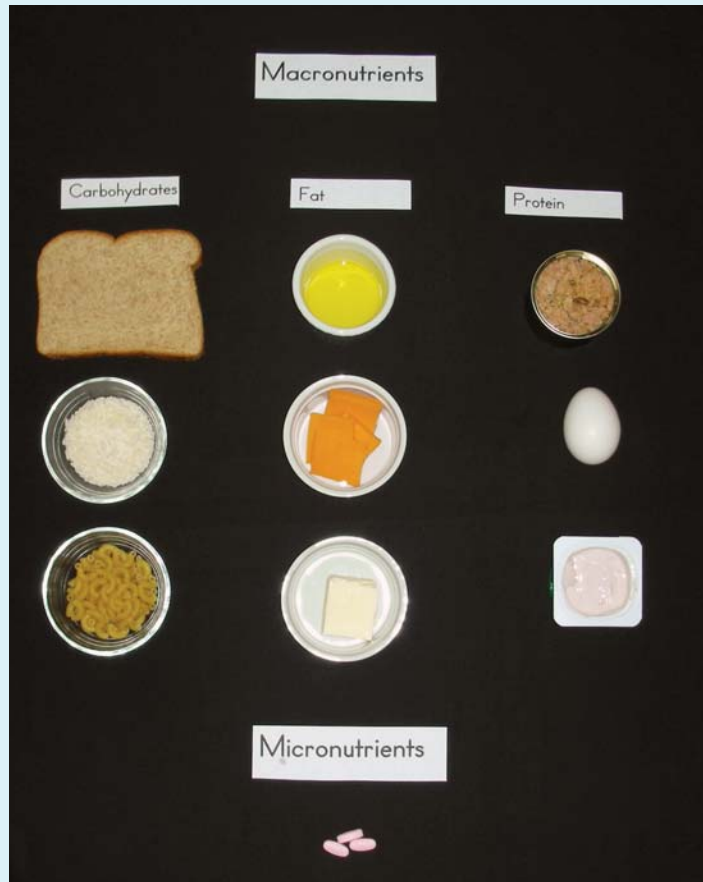
Health Sciences journals and pencils.



Presentation

- Most Montessori teachers introduce this concept in Year 1 and present it in more detail in Years 2 and 3.
- Announce that students will have an opportunity to learn more about why food is so important to humans.
- Define and discuss the two meanings of nutrition (both a process and a study). Point out that it is important to learn about nutrition to understand about how to keep healthy.
- Define and discuss nutrients, the food and other substances required for nourishment and health. Explain that the body needs nutrients to function properly and that there are two kinds of nutrients: macronutrients and micronutrients.
- Discuss how the four kinds of macronutrients (carbohydrates, fats, proteins, water) function in the body.
- Demonstrate the macronutrient food samples, naming each and the category in which it is placed. Invite the students to suggest other food samples that could be placed in each category.
- Discuss how micronutrients (vitamins and minerals) function in the body.

- Demonstrate the micronutrient samples, naming each and the category in which it is placed. Invite the students to suggest other samples that could be placed in each category.
- Emphasize that only a small amount of each vitamin or mineral is needed daily by the body. Discuss how, compared to vitamins and minerals, the human body needs fairly large quantities of carbohydrates, fats, proteins, and water in order to stay healthy.
- Ask the students to use their journals to make a list of macronutrients (carbohydrates, fats, proteins, water) and micronutrients (vitamins and minerals), then draw a picture of one food that supplies each nutrient.



Extensions

- Make a labeled, colored poster of macronutrients and micronutrients and show pictures of foods that supply each nutrient.

ACTIVITY 2

Exploring the National Food Guide

Purpose

To become familiar with the national food guide and the basic food groups.

Material

National food guide (appropriate to the country in which the school is located).

Old magazines.

Scissors, poster boards, glue, and felt markers.

Resources on food and nutrients (e.g., encyclopedia, cookbook, reference book on nutrition).

Health Sciences journals and pencils.

Presentation

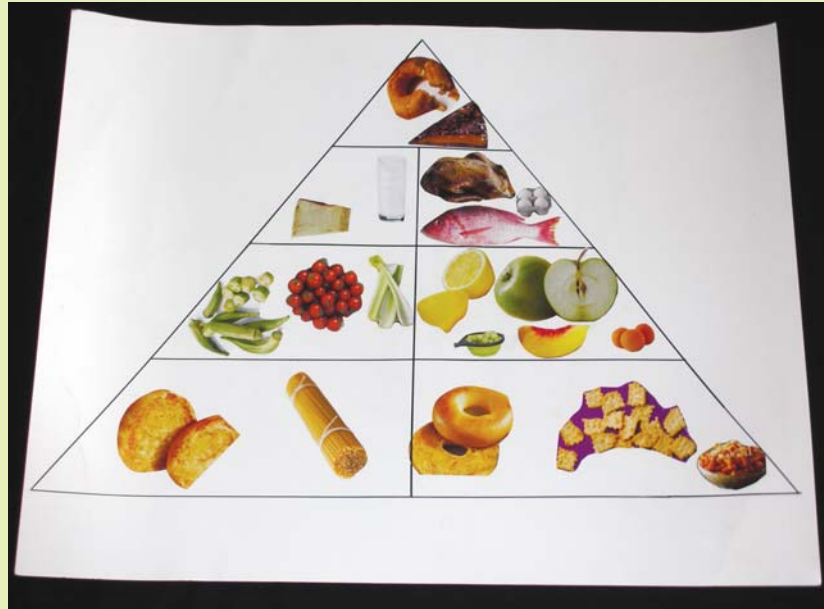
- Most Montessori teachers introduce this concept in Year 1 and present it in more detail in Years 2 and 3.
- Announce that students will have an opportunity to examine a guide that shows what kinds of foods need to be eaten each day for good health.
- Review the types of nutrients that the body needs to grow and be healthy (macronutrients and micronutrients).
- Explain the terms balanced diet and unbalanced diet. Point out that it is important to get all of the nutrients in a daily diet, but that people cannot tell by looking at food how much of each



nutrient the food contains.

- Demonstrate the national food guide. Explain that this guide shows the basic food groups and the amount of food that a person needs daily from each group to stay healthy.
- Point to and discuss each of the basic food groups (fruits, vegetables, meat and meat alternatives, milk and milk alternatives, grains and grain products, discretionary or other foods). Point to the pictures or words given as examples of foods in each group and invite the students to take turns naming the foods aloud.
- Demonstrate the magazines and art supplies. Ask the students to design and make their own food guides based on the food groups shown in the national food guide. The students can use markers to

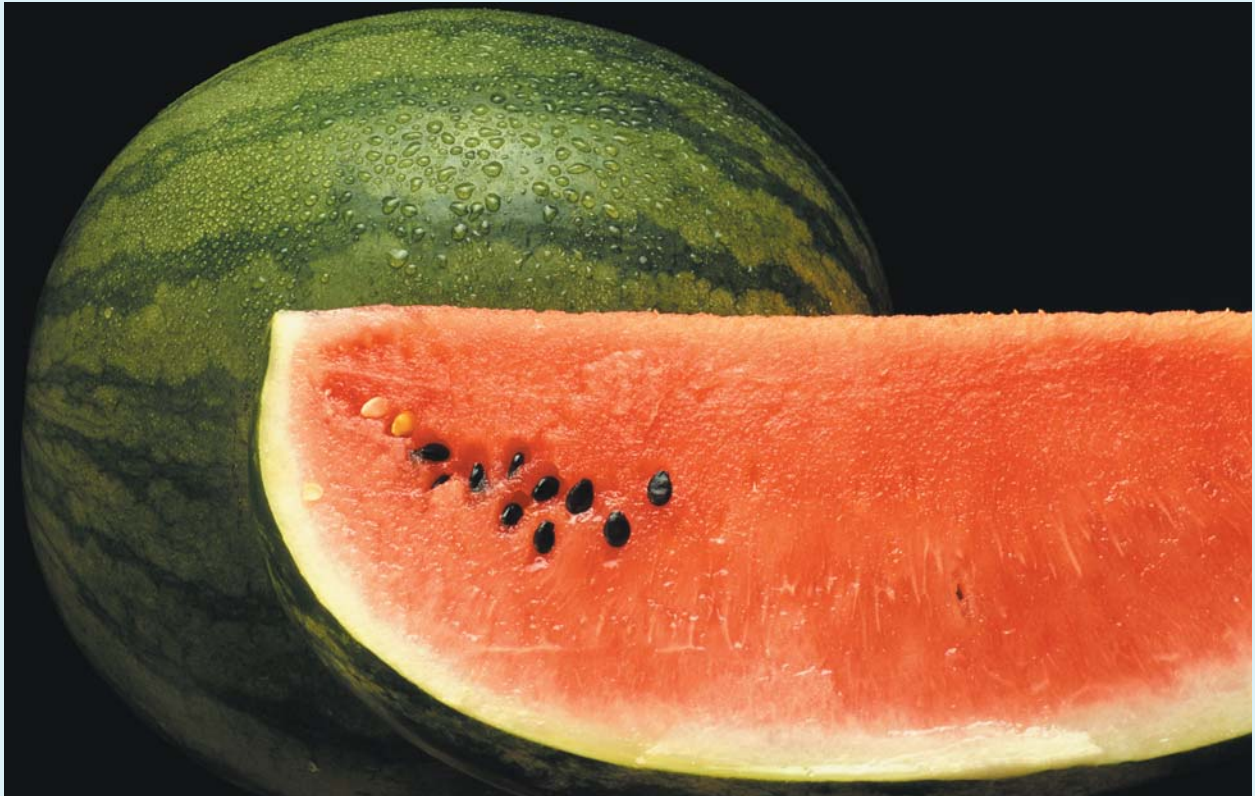
list the major food groups on a large sheet of poster board, then cut pictures of food from the magazines and glue the pictures in the appropriate groups as shown in the national food guide. Encourage the students to create their own designs and to draw and attach pictures of foods that their families eat, but that are not included in the magazines.



- Demonstrate classroom resources the students can use for identification (e.g., encyclopedias, cookbooks, websites). Explain that students who find pictures that they cannot place into a food group can research those pictures using the resources.
 - Encourage students to take their food guides home at a later date and hang them where they and their families can refer to them as they choose and prepare food.
 - Research how certain foods are made, such as tofu or cheddar cheese.
 - Keep a list for one day of all the foods eaten, and in what quantities. Refer to the national food guide to assess whether the food eaten that day amounted to a balanced diet.
 - Using the national food guide as a reference, make a poster showing the food that would be eaten in one day as part of a balanced diet.
 - Write and act out a play illustrating the major food groups found in the national food guide.
- Extensions**
- Arrange a field trip to a farmers' market or a supermarket and discuss to which food group different kinds of food belong.
 - Make a list of five unfamiliar foods. Write a short report describing where each food comes from and in which food group it belongs.

ACTIVITY 3

Discovering the Calories in Food



Purpose

To learn what calories are and how the body uses them.

Material

National food guide (appropriate to the country in which the school is located).

Health Sciences journals and pencils.

Presentation

- Most Montessori teachers introduce this concept in Year 1 and present it in more detail in Years 2 and 3.
- Announce that today students will have an opportunity to see how much energy foods contain.
- Define and discuss energy. Explain that the amount of energy provided by food is measured in small units called calories, which cannot really be seen, but that scientists can measure.
- Discuss how all foods contain calories and that some foods contain more calories than others. Explain that following the national food guide is a good way for a person to ensure that she/he is taking in a suitable number of calories each day. Emphasize that calories are needed to provide energy for the body to function.

- Refer to the national food guide and with the students discuss which food groups contain the fewest and the most calories.
- Point to the category in the national food guide referred to as “discretionary calories” or “other foods” — foods that contain more calories than are essential for good nutrition. Explain that those foods are grouped together because they have a lot of calories compared to other foods, and are not necessary for good nutrition. Ask the students to suggest a few examples of familiar foods that fall into this category. Point out that by eating too many items from this category, a person could easily get all of the calories she/he needs in a day (and more) without receiving the nutrition needed for the day.
- Explain that people require different amounts of calories (energy) depending on their age, sex, height, weight, and level of physical activity. Discuss what might happen if a person over a period of time takes in more calories (fuel) than he/she needs every day (adds weight). Discuss what might happen if a person over a period of time does not take in as many calories (fuel) as she/he needs every day (loses weight).

- Discuss the fact that while it is important to take in all of the foods needed for good nutrition, it is also important to do regular physical activity, which not only keeps the body strong and fit, but also uses up energy provided by food.
- Ask the students to use their journals to draw and label a plan for one meal that meets the recommendations set out by the national food guide, then draw one type of physical activity that can be done before or after the meal.

Extensions

- Draw or write out a meal plan for one whole day that meets the recommendations set out by the national food guide.
- Make a list of three favorite physical activities, research how many calories each consumes, and create a table showing the results.
- Plan and help prepare a family dinner that incorporates foods from each food group.
- Research and list the number of calories contained in five items from a fast foods restaurant.

ACTIVITY 4

Reading Nutrition Labels

Purpose

To discover how useful nutrition labels can be for making healthy food choices.

Material

National food guide (appropriate to the country in which the school is located).

Bag of potato or corn chips that, according to the nutrition label, contains more than one serving.

Several small bowls (up to six).

Variety of other food packages with nutrition labels.

Health Sciences journals and pencils.

SAFETY NOTE: In advance, review student allergies to see what packaged food can be used in this activity. What is important is that the food is in small pieces and has a nutrition label showing number of servings.

Presentation

- Most Montessori teachers introduce this concept in Year 1 and present it in more detail in Years 2 and 3.
- Announce that students will have an opportunity to examine labels that give information about the nutrition in food.
- Demonstrate the national food guide. Review information about calories and



about the usefulness of the food guide for making healthy choices in food.

- Explain that students can also refer to nutrition labels on packaged and prepared foods to find information about the nutrients in food.
- Demonstrate the bag of chips. Ask the students how much of the bag would they normally eat by themselves. The whole bag? Half? Just a few chips?
- Point out the nutrition label on the bag of chips and explain that this label provides important and useful nutrition information about the food.
- Review the terms used on most nutrition labels (e.g., carbohydrates, calories, sodium), defining and discussing terms as needed.

- Invite the students to examine the nutrition label and read aloud the nutrients listed.
- Define and discuss serving size. Point out the location of the serving size listed on the label, then ask one of the students to read the serving size aloud. Explain that the nutrition information provided on the label is always based on the serving size listed, which, in this case, is not the whole bag. Open the bag of chips and place a single-portion serving in each of the small bowls. With the students, review the calories and nutrients contained in each serving.
- Ask the students to use their journals to calculate the number of calories (as well as the amount of sodium and fat, if so

desired) that would be consumed if one person ate the whole bag of chips.

Extension

- Design a warning sign for people who might not know that the packaged food they are eating contains multiple servings. Include on the sign reasons why serving size is important. Draw a picture of the design as it would look on a packaged food.
- Research and write a short report on ways to keep a healthy weight.
- Write a short report comparing the nutrition labels on three or more food packages. Which food is the most nutritious and which the least, according to the nutrition labels?