INTRODUCTION
This Teacher’s Guide provides information to help you get the most out of *Diet and Disease in Modern Society*. The contents of this guide will allow you to prepare your students before using the program, and to present follow-up activities to reinforce the program’s key learning points.

This program is designed to provide students with an understanding of the impact diet and nutrition has on their health. It offers information on the food choices that contribute to cardiovascular disease, being overweight, obesity, diabetes, and cancer. The program also discusses foods that have a beneficial impact on health, especially the heart, weight gain, and preventing cancer.

LEARNING OBJECTIVES
After viewing the program, students will be able to:

- Describe the role that diet and nutrition have in contributing to and preventing cardiovascular disease.
- Describe the role that diet and nutrition have in contributing to and preventing weight gain and obesity.
- Describe the role that diet and nutrition have in contributing to and preventing certain types of cancer.
- Discuss the importance of proper diet and nutrition in leading a healthy life.
- List the four risk factors for cardiovascular disease, and the role of food in those risk factors.
- Identify the three types of fat and the role they play in diet.
- List the two types of fiber and the role they play in diet.

EDUCATIONAL STANDARDS
This program correlates with the National Science Education Standards from the National Academies of Science and the National Health Education Standards from the American School Health Association. The content has been aligned with the following educational standards and benchmarks from these organizations.

- Knows essential concepts about the prevention and control of disease.
- Understands how lifestyle, pathogens, family history, and other risk factors are related to the cause or prevention of disease and other health problems.
- Knows how to maintain and promote personal health.
- Knows strategies and skills that are used to attain personal health goals (e.g., maintaining an exercise program, making healthy food choices).
- Knows how personal behaviors relate to health and well-being and how these behaviors can be modified if necessary to promote achievement of health goals throughout life (e.g., following a personal nutrition plan to reduce the risk of disease; periodically self-assessing physical fitness).
PROGRAM OVERVIEW
What’s so bad about saturated fat, and what makes fiber so good? In a society where convenience foods rule and obesity is a national epidemic, it’s time to find out. *Diet and Disease in Modern Society* investigates the relationship between diet and a number of frequently interrelated diseases and conditions, including heart attack, stroke, high blood pressure, hardening of the arteries, obesity, type II diabetes, and cancer. Topics that will be addressed in this program include high- and low-density lipoproteins; saturated, monounsaturated, and polyunsaturated fats; soluble and insoluble fiber; electrolyte minerals; antioxidants and free radicals; the effects of smoking and alcohol consumption; Disability-Adjusted Life Years; and the Body Mass Index. “You are what you eat!” isn’t just a cliché, it’s a fact of life—and of good health.

MAIN TOPIC AREAS

**Topic 1: Introduction**
Introduces the topic by discussing the links between diet and disease by sharing key statistics on human health.

**Topic 2: Cardiovascular Disease and Nutrition**
Describes the different types of cardiovascular disease and how they are impacted by diet and nutrition. Discussion focuses on the impact of diet, weight and cholesterol levels in contributing to cardiovascular diseases such as high blood pressure, heart attacks, and strokes.

**Topic 3: Overweight and Obesity and Nutrition**
Segment focuses on the link between weight and health risks—specifically, type II diabetes. Discussion highlights how even modest weight loss can have a positive impact on a person’s health, and the role that food can play in a person’s weight and the onset of diabetes.

**Topic 4: Cancer and Nutrition**
Topic focuses on the types of cancers that have been linked to diet and nutrition, and how to reduce your risk for these cancers. Segment features a discussion on the role of free radicals, antioxidants, and phytochemicals in cancer.

**Topic 5: Conclusion**
Summarizes the program by reviewing the importance of proper diet and nutrition in preventing certain health problems. The discussion is reinforced through powerful statistics and facts.

FAST FACTS
- Tobacco is estimated to be responsible for 9.8% of total Disability Adjusted Life Years (DALY).
- Diet or nutritional intake is estimated to account for 10% of total Disability Adjusted Life Years (DALY).
- In the U.S., cardiovascular disease kills more people than any other cause, accounting for an estimated 40% of all deaths.
- Cardiovascular disease claims more lives each year than the next five leading causes of death combined.
Cholesterol is vital to our body. One of its main functions is transporting important nutrients and fats around the body.

High blood pressure, or hypertension, doubles and may even quadruple the risk of cardiovascular disease.

It is estimated that one out of every four people in developed countries have high blood pressure.

High blood pressure can lead to stroke, heart attack, or hardening of the arteries.

About 75% of the salt we eat comes from processed foods.

Diabetes is the seventh leading cause of mortality in industrialized countries. For every death for which diabetes is the primary cause, there are more than two deaths in which diabetes is a contributing cause of death.

Diabetes currently affects 120 million people worldwide; this number is expected to increase to 240 million by 2010 and 300 million by 2025. In the U.S. about eleven million people have been diagnosed with diabetes, and nearly 6 million suffer from the disease without being aware of it.

Type II diabetes is the most common form of diabetes worldwide; in the U.S. it accounts for 90% to 95% of diabetes cases. Its prevalence increased 33% from 1990 to 1998, with much of the increase due to our dramatic upsurge in obesity.

Cancer is the second leading cause of death in developed countries. Some estimates attribute one-third of all cancer deaths in developed countries to the diet of the population.

Life expectancy was short until the 19th century, when we started to understand basic hygiene and the role of antiseptics in good medicine.

Each year in the U.S. over $33 billion in medical costs and $9 billion in lost productivity due to heart disease, cancer, stroke, and diabetes is attributed to diet.

VOCABULARY TERMS

Blood pressure: The force of blood against the walls of arteries.

Body Mass Index (BMI): Formula for calculating a human’s healthy weight range.

Cardiovascular disease: Breakdown in the efficient and effective working of the cardiovascular system.

Cholesterol: Soft, crystalline fat found in the blood.

DALY: Disability Adjusted Life Years. Measure of influence of disease on populations by calculating the years of healthy life lost through poor health or disease.

Diabetes: Condition that affects the body’s ability to regulate the level of glucose in the blood.

Free radicals: Unstable molecules of oxygen that float freely throughout our bodies seeking to re-balance themselves by stealing electrons from normally healthy cells.

Glucose: The body’s main form of sugar.

Heart attack: Acute episode of heart disease due to insufficient blood supply to the heart muscle.

Hypertension: Abnormally high blood pressure.

Phytochemical: Chemical that acts as a powerful antioxidant.

Obesity: Condition characterized by excessive fat.
PRE-PROGRAM DISCUSSION QUESTIONS
2. What can you do to reduce your health risks?
3. What are some of the health risks that are associated with being overweight?
4. What types of foods are considered part of a healthy and balanced diet?
5. Does anyone you know have health problems? How does it impact their life?

POST-PROGRAM DISCUSSION QUESTIONS
1. What changes can you make in your diet to reduce the risk of disease? What changes can your family members make?
2. How can you reduce your risk of diabetes? Heart disease? Cancer?
3. What types of foods contain antioxidants? How do these foods contribute to a healthy diet?
4. Is all fat bad for you? If not, what are some fat-containing foods that are considered “good for you” when consumed in moderation?
5. How does poor diet and nutrition impact the economy and society as a whole?

GROUP ACTIVITIES
Assess Diabetes Risk
Define type I and II diabetes and identify the risk factors for both. Assess each group member’s level of risk based on these factors, and then identify the things each can do to reduce their risk of diabetes.

Healthy Foods Checklist
Develop a list of healthy foods and their benefits for each of the following categories:
• Reducing/preventing cardiovascular disease
• Reducing the risk of cancer

Preventing Over-Consumption
Develop a meal schedule for an entire seven-day week that adheres to the recommended daily caloric intake for teenagers while incorporating healthy nutrition.

INDIVIDUAL STUDENT PROJECTS
What Do I Eat?
Ask students to keep a food diary for a week. The diary should record the following for each item consumed:
• What they ate
• The number of servings they consumed
• The number of calories per serving
• The percentage of daily salt, saturated fat, and fiber intake

At the end of the week, ask students to total their daily caloric intake and the percentage of salt, saturated fat, and fiber and compare it to the recommended daily intake for each. Based on the diary, students should create a list of the foods they ate which reduce certain health risks (i.e., eating foods rich in antioxidants, etc.). Then students should develop a plan for improving their diet in areas where they have been making poor health choices.
Develop a Low Fat Diet
Use nutritional guidelines to identify foods that are included in a low fat diet. Then plan a meal that is low in fat, using the foods you identified.

Identify Foods High in Antioxidants
List foods that are high in antioxidants, and then create a daily food plan that incorporates several of these items.

INTERNET ACTIVITIES
Calculate Your Body Mass Index (BMI)
Locate a BMI calculator on the internet and use it to calculate your BMI. Determine if your BMI is normal for your gender and age.

Create a Heart Smart Cookbook
Search the internet for a heart-smart recipe that you and your family can prepare at home. Ask students to bring the recipe to class, then have the class create a “Heart Smart” recipe book that they can take home to share with their family.

Nutritional Health Resources
Identify at least seven websites that provide information on how to improve health through diet and nutrition and reduce the risk of heart disease, diabetes and cancer. Provide a brief description of each resource and how it might be beneficial to the student.

ASSESSMENT QUESTIONS
Q: What are the four risk factors associated with cardiovascular disease?
(a) High blood fats and cholesterol, high blood pressure, overweight or obesity, and type II diabetes.
(b) High blood fats and cholesterol, high blood pressure, overweight or obesity, and type I diabetes.
(c) High blood fats, high cholesterol, high heart rate, overweight or obesity, and type II diabetes.
(d) High blood fats and cholesterol, high heart rate, overweight or obesity, and type I diabetes.
A: (a)
Feedback: A high heart rate and type I diabetes are not associated with increased risk of cardiovascular disease.

Q: ______ fiber is mainly found in plant cells.
A: Soluble
Feedback: Common sources of soluble fiber include legumes (dried peas and beans), oats, barley, and most fruits. Insoluble fiber includes cellulose, which makes up the structural parts of plant cell walls. Insoluble fiber is found in breakfast cereals, bran, whole-wheat and whole-grain breads and cereals. Most plant foods contain a mixture of both types of fiber.
Q: Approximately what percentage of the salt we eat comes from processed foods?
   (a) 45%
   (b) 55%
   (c) 65%
   (d) 75%
A: (d)
Feedback: Salt is found in almost every food we eat, but the amount present in different foods varies a great deal. While we do need to eat some salt, we can easily get our requirements from the natural salt in fresh foods, so there is no need to add salt to a healthy eating plan.

Q: List some of the complications that can arise from diabetes.
A: Heart disease, stroke, high blood pressure, blindness, kidney disease, amputations, nerve problems, dental disease, complications of pregnancy, and susceptibility to infection can all arise from diabetes.
Feedback: Diabetes is the seventh leading cause of mortality in industrialized countries. However, this figure doesn’t quite tell the full story because, if it is not well controlled, people with diabetes are more likely to develop several other conditions which may result in disability or death. These may be referred to as complications of diabetes.

Q: What type of fat is generally found in animal fats like beef fat, poultry skin, and whole milk dairy products?
   (a) Mono-unsaturated fat
   (b) Polyunsaturated fat
   (c) Saturated fat
   (d) Unsaturated fat
A: (c)
Feedback: Saturated fat generally comes from animal sources. Mono-unsaturated fats and polyunsaturated fats are typically found in oils.

Q: List five food items that contain phytochemicals.
A: Phytochemicals are found in fruits and vegetables, along with other vegetable products such as cereals, legumes, and nuts.
Feedback: Dark green, orange, and yellow foods contain beta-carotene, a phytochemical believed to lower cancer risk by acting as a powerful antioxidant. Citrus fruits and other fruits and vegetables may decrease the risk of esophageal and stomach cancer. Citrus fruits are high in vitamin C, another strong antioxidant. Tomatoes and tomato juice contain lycopene, which has been linked to a lower risk of heart disease and certain cancers, including prostate cancer.

Q: Unstable molecules of oxygen that float freely throughout our bodies seeking to re-balance themselves by stealing electrons from healthy cells are called ___________.
A: free radicals
Feedback: Free radicals are generally removed quickly by reaction with anti-oxidants, but if antioxidants are in short supply there is a greater risk of oxidative damage to cells—damage that can lead to cancers and other serious health conditions.
Q: Cruciferous vegetables, which may help protect against colon cancer and stomach cancer, include:
   (a) cabbage, broccoli, and cauliflower
   (b) tomatoes, cucumbers, and brussel sprouts
   (c) herbs, lettuce, and spinach
   (d) potatoes, peppers, and garlic
A: (a)
Feedback: Cruciferous vegetables contain phytochemicals called indoles, which, along with beta-carotene, fiber, and vitamin C, have cancer-fighting properties.

Q: List five common sources of insoluble fiber.
A: Bran, whole-wheat and whole-grain breads and cereals, strawberries, potatoes, and peppers.
Feedback: Some scientists believe that insoluble fiber can aid in protecting against colon cancer. Increased bulking of wastes and a faster passage of waste through the gastrointestinal system is thought to minimize exposure to potential cancer-causing compounds.

Q: The recommended daily intake of dietary fiber is ____ grams.
   (a) 15
   (b) 20
   (c) 25
   (d) 30
A: (c)
Feedback: While the recommended daily intake of dietary fiber is 25 grams or more, Americans consume an average of only 15.6 grams per day.

Q: What factors contributed to an increased life expectancy during the 19th century?
A: Hygiene and antiseptics, as well as penicillin and other antibiotics.
Feedback: Life expectancy was short until the 19th century, when we started to understand basic hygiene and the role of antiseptics in good medicine. But infection continued to be the main cause of death until after 1945, when the introduction of penicillin and other antibiotics became an effective means of fighting bacterial infections such as pneumonia, meningitis, leprosy, and tuberculosis.

Q: ____ is the second leading cause of death in developed countries.
A: Cancer
Feedback: While there are many forms of cancer with as many different relationships to diet, a low cancer-risk diet is low in fat and high in fresh fruits, vegetables, and whole grains. By eating this way, we minimize our risk of developing cancer. A diet rich in saturated fat is thought to especially increase our cancer risk.


**ADDITIONAL RESOURCES**

**Keep Kids Healthy**
www.keepkidshealthy.com

**American Heart Association**
www.americanheart.org

**American Diabetes Association**
www.diabetes.org

**American Cancer Society**
www.cancer.org

*Betty Crocker’s Diabetes Cookbook: Everyday Meals, Easy as 1-2-3*

*Take a Load Off Your Heart: 114 Things You Can Do to Prevent or Reverse Heart Disease,*


*Nutrition and Cancer,* VHS and DVD, Cambridge Educational
Over 360,000 cancer deaths each year are attributed to diet. This program focuses on the relatively new field of nutritional oncology and efforts to prove the relationship between cancer and nutrition. Various studies on animals and humans are discussed. One in particular, conducted on Japanese-Americans with high-fat diets, shows a high rate of colon and other cancers, while their counterparts in Japan eating low-fat diets are virtually cancer-free. A breast cancer patient discusses how lowering body fat helped reduce the risk of recurrence. After analyzing how cancers develop, a doctor describes how low-fat diets, high in fiber and fresh fruits, actually inhibit the processes of cancer cell growth.

*Breakfast: Most Important Meal of the Day,* VHS and DVD, Meridian Education
Greater physical stamina, better concentration at school or work, a more efficient metabolism—the evidence is overwhelming that a healthy breakfast is the key to a productive day. Yet it’s the meal most likely to be skipped by children, teenagers, and adults alike. This video brings home the importance of the day’s first meal by exploring the numerous mental and physical benefits of a nutritious breakfast. Viewers will understand the relationship between eating and metabolism, specifically between breakfast and blood-sugar levels. The kinds of foods that best fuel the body in the morning are also listed.
Item no: 30704, www.meridianeducation.com, 1-800-727-5507