Grade 4
An Integrated Nutrition Curriculum

Developed by the North Carolina Nutrition Education and Training Program
January 2007

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Welcome to Food for Thought, a K-5 curriculum that allows you to teach the nutrition objectives of the Healthful Living Standard Course of Study while integrating the concepts of healthy eating and physical activity into Math and English Language Arts. The matrix summarizes the objectives addressed in each lesson. The lessons flow best when presented in the order listed.

Effective nutrition education can motivate and enable students to adopt healthful dietary patterns and healthy lifestyles. Food for Thought will allow you to deliver effective nutrition education. There are many benefits for students who are well nourished and physically active. These include:

- Improved attendance
- Improved energy level
- Improved participation
- Improved behavior
- Improved test scores
- Improved academic success
- Reduced fatigue
- Reduced irritability
- Reduced apathy
- Reduced anxiety
- Reduced infections
- Reduced absences

Each lesson in Food for Thought includes the following sections:

- **Objectives:** Healthful Living, Math and English Language Arts objectives
- **Teacher Resources:** background information to help prepare the lesson is included
- **Materials Needed:** additional items have been kept to a minimum
- **Handouts:** all student handouts are included with this packet
- **Focus:** an activity designed to get students focused on the topic to be covered in the lesson
- **Teacher Input:** material to be presented by the teacher
- **Practice and Assessment:** handouts and activities to be completed by students

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## Food for Thought
### Healthful Living/ Math/ English Language Arts Objectives
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Teacher Resources

Grade 4

Digestive Diagram
Digestion Process
Most Wanted Fact Sheets
Four Simple Steps to Food Safety
Nutrition Facts Label
Food Labels: Nutrient Content Claims
Trends in Portion Sizes
MyPyramid for Kids
What Foods are in the Fruit Group?
What Foods are in the Vegetable Group?
Water
Food Advertising Strategies
Digestion Process

**Teeth:** Like most mammals, humans have different types of teeth for biting and chewing. Ask students if all their teeth look the same. Ask how the front teeth differ from the back teeth. Front teeth (incisors) are sharper and bigger, back teeth (molars) are flat and broad. While food is broken down somewhat by chewing and grinding, most digestion takes place by body chemicals. Chemicals known as enzymes break down food in the mouth, stomach and small intestines.

**Saliva:** Digestion begins in the mouth. As teeth crush and grind the food, an enzyme in saliva begins breaking down the starches into sugar. Ask the students what happened when they put the saltine in their mouth at the beginning of class. Look at the label on the package. Saltines are made from flour and have little or no sugar. Explain to students that the sweet taste means an enzyme in their saliva had started to break down the starch to sugar. This is one of the first steps in digestion. Starches are broken down into sugars.

**Swallowing:** After food leaves the mouth it goes down the esophagus. Show the students where the esophagus is on the overhead. Demonstrate swallowing by place the orange at the top of the stocking. Use your hands to move the orange down the tube. Muscle waves along the esophagus help squeeze the bolus of food to the stomach. This process is called peristalsis. Your esophagus muscles take seven seconds to push a ball of food from your throat to your stomach.

**Stomach and intestines:** After the food leaves the esophagus it goes into the stomach. Strong muscles in the elastic stomach squeeze and mash the food to break it down. Digestives juices made of chemicals and enzymes also help break down proteins in the food. The food then enters into the small intestines to be broken down further by digestive enzymes from the liver, pancreas and gallbladder. After the food is digested into small particles, it moves from the digestive tract into the body. The nutrients from the food pass into the blood and are carried to every cell in the body where they will be used to build new cells, repair old ones and provide the body with energy. That is why it is important to eat healthy foods to build and repair all the parts of our body. Undigested materials such as fiber and water continue into the large intestines. The large intestines absorb the water turning it into a paste which is excreted through the anus.

Source: The Incredible Human Body by E. Weiner
MOST WANTED

E. COLI

Known Associates: Ground meat and raw milk

Hide-outs: Dairy cows, water, and people

Crimes: Severe abdominal cramps, watery diarrhea, bloody diarrhea, kidney failure, blood clots in the brain. Symptoms appear 2 to 9 days after eating contaminated food.

Ways to Outsmart Them:
- Cook meat thoroughly
- Wash hands before handling food
- Avoid cross-contamination
MOST WANTED

SALMONELLA

Known Associates: Raw meats, poultry, eggs, milk, and products made from them.

Hide-outs: On people, pets, insects, and rodents.

Crimes: Diarrhea, abdominal cramps, and vomiting within 12 - 36 hours after eating food containing bacteria.

Ways to Outsmart Them:
• Cook foods thoroughly
• Keep hot foods hot
• Keep cooking surfaces and utensils clean
• Refrigerate or freeze foods promptly
• Reheat leftovers to at least 160°F
• Wash hands before eating and after handling raw foods.
MOST WANTED

CLOSTRIDIUM PERFRINGENS

Known Associates: High protein foods like meat, poultry, and eggs.

Hide-outs: Soil, sewage, dust, crops, meat, and poultry.

Crimes: Nausea, diarrhea, and gas pains 8 - 24 hours after eating.

Ways to Outsmart Them:
- Cook high protein foods thoroughly
- Keep hot foods hot
- Keep cold foods cold
- Refrigerate foods in shallow containers
Most Wanted

Staphylococcus Aureus

Known Associates: Moist meat dishes, meat salads, sliced meats, potato salad, and cream-filled foods, such as eclairs, cream puffs, and cake fillings.

Hide-outs: Nasal passages of humans and animals and on skin, especially face and arms.

Crimes: Nausea, vomiting, diarrhea, and severe cramps within 3 - 8 hours.

Ways to Outsmart Them:
• Wear gloves or don't handle food if you have an infected cut.
• Wash hands before handling food.
• Clean utensils and countertops with hot, soapy water.
• Cook foods thoroughly.
• Cool or freeze food immediately after a meal.
Four Simple Steps to Food Safety

Right now, there may be an invisible enemy ready to strike. He’s called BAC (bacteria) and he can make you and those you care about sick. In fact, even though you can’t see BAC — or smell him, or feel him — be and millions more like him may have already invaded the food you eat.

But you have the power to Fight BAC! And to keep your food safe from harmful bacteria. It’s as easy as following these four simple steps:

**CLEAN**
Wash hands and surfaces often

Bacteria can spread throughout the kitchen and get onto cutting boards, utensils, sponges and countertops. Here’s how to Fight BAC:

- Wash hands, utensils and surfaces in hot soapy water before and after food preparation and especially after preparing meat, poultry, eggs or seafood to protect adequately against bacteria. Using a disinfectant cleaner or a mixture of bleach and water on surfaces can provide some added protection. Also, remember to wash your hands after using the bathroom, changing diapers or handling pets.
- Use plastic or other non-porous cutting boards. These boards should be run through the dishwasher – or washed in hot soapy water – after use.
- Consider using paper towels to clean up kitchen surfaces. If you use cloth towels, wash them often in the hot cycle of your washing machine.

**SEPARATE**
Don’t cross-contaminate

“Cross-contamination” is the scientific term for how bacteria can be spread from one food product to another. This is especially true when handling raw meat, poultry and seafood, so keep these foods and their juices away from ready-to-eat foods. Here’s how to Fight BAC:

- Separate raw meat, poultry and seafood from other foods in your shopping cart and in your refrigerator.
- If possible, use a different cutting board for raw meat products.
- Always wash hands, cutting boards, dishes and utensils with hot soapy water after they come in contact with raw meat, poultry and seafood.
- Never place any food on a plate which previously held raw meat, poultry or seafood.

**COOK**
Cook to proper temperatures

Food-safety experts agree that foods are properly cooked when they are heated for a long enough time and at a high enough temperature to kill the harmful bacteria that cause foodborne illness. The best way to Fight BAC! is to:

- Use a clean thermometer, which measures the internal temperature of cooked foods, to make sure meat, poultry, casseroles and other foods are cooked all the way through.
- Cook roasts and steaks to at least 145°F. Whole poultry should be cooked to 180°F for doneness.
- Cook ground beef, where bacteria can spread during processing, to at least 160°F. Information from the Centers for Disease Control and Prevention (CDC) link eating undercooked, pink ground beef with a higher risk of illness. If a thermometer is not available, do not eat ground beef that is still pink inside.
- Cook eggs until the yolks and whites are firm. Don’t use recipes in which eggs remain raw or only partially cooked.
- Fish should be opaque and flake easily with a fork.
- When cooking in a microwave oven, make sure there are no cold spots in food where bacteria can survive. For best results, cover food, stir and rotate for even cooking. If there is no turntable, rotate the dish by hand once or twice during cooking.
- Bring sauces, soups and gravy to a boil when reheating. Heat other leftovers thoroughly to at least 165°F.

**CHILL**
Refrigerate promptly

Refrigerate foods quickly because cold temperatures keep harmful bacteria from growing and multiplying. So, set your refrigerator no higher than 40°F and the freezer unit at 0°F. Check these temperatures occasionally with an appliance thermometer. Then, Fight BAC! by following these steps:

- Refrigerate or freeze perishables, prepared foods and leftovers within two hours or sooner.
- Never defrost food at room temperature. Thaw food in the refrigerator, under cold running water or in the microwave. Marinate foods in the refrigerator.
- Divide large amounts of leftovers into small, shallow containers for quick cooling in the refrigerator.
- Don’t pack the refrigerator. Cool air must circulate to keep food safe.

Compliments of The Partnership for Food Safety Education

Visit our web site: www.fightbac.org
THE RIGHT TOOL TO BALANCE YOUR DIET

You probably already use the Nutrition Facts label in some way—maybe to check calories, fat or sodium content. But, the more familiar you are with the information, the more you’ll want to use it daily to ensure you’re eating a healthy, balanced diet.

Use the label when you shop, as you plan your meals, and as you cook each day. The label makes it easy to determine the amounts of nutrients you’re getting and to compare one product to another:

Strive for a diet that emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products. Include lean meats, poultry, fish, beans, and nuts. Choose foods that are low in saturated fats, trans fats, cholesterol, salt, and added sugar.

Regular physical activity is important for your overall health and fitness. It also helps you control body weight by balancing the calories you take in from food with the calories you expend each day. For more information, visit www.healthierus.gov/dietaryguidelines.

HERE’S WHERE TO FIND MORE INFORMATION ON HEALTHY LIVING:

U.S. Department of Health and Human Services

Dietary Guidelines for Americans
www.healthierus.gov/dietaryguidelines

Dietary Approaches to Stop Hypertension (DASH)
www.nhlbi.nih.gov/health/public/heart/hbp/dash

U.S. Food and Drug Administration

Nutrition Facts Label
www.cfsan.fda.gov/~dms/foodlab.html

U.S. Centers for Disease Control and Prevention

Nutrition and Physical Activity
www.cdc.gov/nccdphp/dnpa

U.S. Department of Agriculture

Nutrition Information
www.nutrition.gov

Food Pyramid
www.mypyramid.gov

FDA is responsible for promoting and protecting the public’s health by ensuring that the nation’s food supply is safe, sanitary, wholesome, and honestly labeled.
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U.S. Department of Health and Human Services
Dietary Guidelines for Americans
www.healthierus.gov/dietaryguidelines

Dietary Approaches to Stop Hypertension (DASH)
www.nhlbi.nih.gov/health/public/heart/hbp/dash

U.S. Food and Drug Administration
Nutrition Facts Label
www.cfsan.fda.gov/~dms/foodlab.html

U.S. Centers for Disease Control and Prevention
Nutrition and Physical Activity
www.cdc.gov/nccdphp/dnpa

U.S. Department of Agriculture
Nutrition Information
www.nutrition.gov

Food Pyramid
www.mypyramid.gov

FDA is responsible for promoting and protecting the public’s health by ensuring that the nation’s food supply is safe, sanitary, wholesome, and honestly labeled.
USE THE NUTRITION FACTS LABEL TO EAT HEALTHIER

Check the serving size and number of servings.
- The Nutrition Facts Label information is based on ONE serving, but many packages contain more. Look at the serving size and how many servings you are actually consuming. If you double the servings you eat, you double the calories and nutrients, including the % DVs.
- When you compare calories and nutrients between brands, check to see if the serving size is the same.

Calories count, so pay attention to the amount.
- This is where you’ll find the number of calories per serving and the calories from fat in each serving.
- Fat-free doesn’t mean calorie-free. Lower fat items may have as many calories as full-fat versions.
- If the label lists that 1 serving equals 3 cookies and 100 calories, and you eat 6 cookies, you’ve eaten 2 servings, or twice the number of calories and fat.

Look for foods that are rich in these nutrients.
- Use the label not only to limit fat and sodium, but also to increase nutrients that promote good health and may protect you from disease.
- Some Americans don’t get enough vitamins A and C, potassium, calcium, and iron, so choose the brand with the higher % DV for these nutrients.
- Get the most nutrition for your calories—compare the calories to the nutrients you would be getting to make a healthier food choice.

Nutrition Facts

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<th>Serving Size 1 cup (228g)</th>
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<tr>
<td><strong>Amount Per Serving</strong></td>
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<tr>
<td>Calories 250</td>
<td>Calories from Fat 110</td>
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**Total Fat** 12g
- Saturated Fat 3g
- Trans Fat 3g

**Cholesterol** 30mg

**Sodium** 470mg

**Potassium** 700mg

**Total Carbohydrate** 31g
- Dietary Fiber 0g
- Sugars 5g

**Protein** 5g

**Vitamin A** 4%

**Vitamin C** 2%

**Calcium** 20%

**Iron** 4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

Calories: 2,000 2,500

| Total fat | 65g 80g |
| Saturated fat | 20g 25g |
| Cholesterol | 300mg 300mg |
| Sodium | 2,400mg 2,400mg |
| Total Carbohydrate | 300g 375g |
| Dietary Fiber | 25g 30g |

Know your fats and reduce sodium for your health.
- To help reduce your risk of heart disease, use the label to select foods that are lowest in saturated fat, trans fat and cholesterol.
- Trans fat doesn’t have a % DV, but consume as little as possible because it increases your risk of heart disease.
- The % DV for total fat includes all different kinds of fats.
- To help lower blood cholesterol, replace saturated and trans fats with monounsaturated and polyunsaturated fats found in fish, nuts, and liquid vegetable oils.
- Limit sodium to help reduce your risk of high blood pressure.

Reach for healthy, wholesome carbohydrates.
- Fiber and sugars are types of carbohydrates. Healthy sources, like fruits, vegetables, beans, and whole grains, can reduce the risk of heart disease and improve digestive functioning.
- Whole grain foods can’t always be identified by color or name, such as multi-grain or wheat. Look for the “whole” grain listed first in the ingredient list, such as whole wheat, brown rice, or whole oats.
- There isn’t a % DV for sugar, but you can compare the sugar content in grams among products.
- Limit foods with added sugars (sucrose, glucose, fructose, corn or maple syrup), which add calories but not other nutrients, such as vitamins and minerals. Make sure that added sugars are not one of the first few items in the ingredients list.

For protein, choose foods that are lower in fat.
- Most Americans get plenty of protein, but not always from the healthiest sources.
- When choosing a food for its protein content, such as meat, poultry, dry beans, milk and milk products, make choices that are lean, low-fat, or fat free.
Food Labels: Nutrient Content Claims

The Food and Drug Administration has regulations that spell out what terms may be used to describe the level of a nutrient in a food and how they can be used. These are the core terms:

**Free:** This term means that a product contains no amount of, or only trivial or "physiologically inconsequential" amounts of, one or more of these components: fat, saturated fat, cholesterol, sodium, sugars, and calories. For example, "calorie-free" means fewer than 5 calories per serving, and "sugar-free" and "fat-free" both mean less than 0.5 g per serving. Synonyms for "free" include "without," "no" and "zero." A synonym for fat-free milk is "skim".

**Low:** This term can be used on foods that can be eaten frequently without exceeding dietary guidelines for one or more of these components: fat, saturated fat, cholesterol, sodium, and calories. Thus, descriptors are defined as follows:
- **low-fat:** 3 g or less per serving
- **low-saturated fat:** 1 g or less per serving
- **low-sodium:** 140 mg or less per serving
- **very low sodium:** 35 mg or less per serving
- **low-cholesterol:** 20 mg or less and 2 g or less of saturated fat per serving
- **low-calorie:** 40 calories or less per serving.

Synonyms for low include "little," "few," "low source of," and "contains a small amount of."

**Lean and extra lean:** These terms can be used to describe the fat content of meat, poultry, seafood, and game meats.
- **lean:** less than 10 g fat, 4.5 g or less saturated fat, and less than 95 mg cholesterol per serving and per 100 g.
- **extra lean:** less than 5 g fat, less than 2 g saturated fat, and less than 95 mg cholesterol per serving and per 100 g.

**High:** This term can be used if the food contains 20 percent or more of the Daily Value for a particular nutrient in a serving.

**Good source:** This term means that one serving of a food contains 10 to 19 percent of the Daily Value for a particular nutrient.

**Reduced:** This term means that a nutritionally altered product contains at least 25 percent less of a nutrient or of calories than the regular, or reference, product. However, a reduced claim can't be made on a product if its reference food already meets the requirement for a "low" claim.

**Less:** This term means that a food, whether altered or not, contains 25 percent less of a nutrient or of calories than the reference food. For example, pretzels that have 25 percent less fat than potato chips could carry a "less" claim. "Fewer" is an acceptable synonym.

**Light:** This descriptor can mean two things. First, that a nutritionally altered product contains one-third fewer calories or half the fat of the reference food. If the food derives 50 percent or more of its calories from fat, the reduction must be 50 percent of the fat. Second, that the sodium content of a low-calorie, low-fat food has been reduced by 50 percent. In addition, "light in sodium" may be used on food in which the sodium content has been reduced by at least 50 percent. The term "light" still can be used to describe such properties as texture and color, as long as the label explains the intent--for example, "light brown sugar" and "light and fluffy."

**More:** This term means that a serving of food, whether altered or not, contains a nutrient that is at least 10 percent of the Daily Value more than the reference food. The 10 percent of Daily Value also applies to "fortified," "enriched" and "added" "extra and plus" claims, but in those cases, the food must be altered.
Alternative spelling of these descriptive terms and their synonyms is allowed—for example, "hi" and "lo"—as long as the alternatives are not misleading.

**Healthy:** A "healthy" food must be low in fat and saturated fat and contain limited amounts of cholesterol and sodium. In addition, if it's a single-item food, it must provide at least 10 percent of one or more of vitamins A or C, iron, calcium, protein, or fiber. Exempt from this "10-percent" rule are certain raw, canned and frozen fruits and vegetables and certain cereal-grain products. These foods can be labeled "healthy," if they do not contain ingredients that change the nutritional profile, and, in the case of enriched grain products, conform to standards of identity, which call for certain required ingredients. If it's a meal-type product, such as frozen entrees and multi-course frozen dinners, it must provide 10 percent of two or three of these vitamins or minerals or of protein or fiber, in addition to meeting the other criteria. The sodium content cannot exceed 360 mg per serving for individual foods and 480 mg per serving for meal-type products.

**OTHER DEFINITIONS**

**Percent fat free:** A product bearing this claim must be a low-fat or a fat-free product. In addition, the claim must accurately reflect the amount of fat present in 100 g of the food. Thus, if a food contains 2.5 g fat per 50 g, the claim must be "95 percent fat free." Implied: These types of claims are prohibited when they wrongfully imply that a food contains or does not contain a meaningful level of a nutrient. For example, a product claiming to be made with an ingredient known to be a source of fiber (such as "made with oat bran") is not allowed unless the product contains enough of that ingredient (for example, oat bran) to meet the definition for "good source" of fiber. As another example, a claim that a product contains "no tropical oils" is allowed—but only on foods that are "low" in saturated fat because consumers have come to equate tropical oils with high saturated fat.

**Meals and main dishes:** Claims that a meal or main dish is "free" of a nutrient, such as sodium or cholesterol, must meet the same requirements as those for individual foods. Other claims can be used under special circumstances. For example, "low-calorie" means the meal or main dish contains 120 calories or less per 100 g. "Low-sodium" means the food has 140 mg or less per 100 g. "Low-cholesterol" means the food contains 20 mg cholesterol or less per 100 g and no more than 2 g saturated fat. "Light" means the meal or main dish is low-fat or low-calorie.

**Standardized foods:** Any nutrient content claim, such as "reduced fat," "low calorie," and "light," may be used in conjunction with a standardized term if the new product has been specifically formulated to meet FDA's criteria for that claim, if the product is not nutritionally inferior to the traditional standardized food, and the new product complies with certain compositional requirements set by FDA. A new product bearing a claim also must have performance characteristics similar to the referenced traditional standardized food. If the product doesn't, and the differences materially limit the product's use, its label must state the differences (for example, not recommended for baking) to inform consumers.

**HEALTH CLAIMS**

Claims for 10 relationships between a nutrient or a food and the risk of a disease or health-related condition are now allowed. They can be made in several ways: through third-party references (such as the National Cancer Institute), statements, symbols (such as a heart), and vignettes or descriptions. Whatever the case, the claim must meet the requirements for authorized health claims—for example, they cannot state the degree of risk reduction and can only use "may" or "might" in discussing the nutrient or food-disease relationship. And they must state that other factors play a role in that disease.

The claims also must be phrased so consumers can understand the relationship between the nutrient and the disease and the nutrient's importance in relationship to a daily diet. An example of an appropriate claim is: "While many factors affect heart disease, diets low in saturated fat and cholesterol may reduce the risk of this disease." The allowed nutrient-disease relationship claims and rules for their use are:
Calcium and osteoporosis: To carry this claim, a food must contain 20 percent or more of the Daily Value for calcium (200 mg) per serving, have a calcium content that equals or exceeds the food's content of phosphorus, and contain a form of calcium that can be readily absorbed and used by the body. The claim must name the target group most in need of adequate calcium intakes (that is, teens and young adult white and Asian women) and state the need for exercise and a healthy diet. A product that contains 40 percent or more of the Daily Value for calcium must state on the label that a total dietary intake greater than 200 percent of the Daily Value for calcium (that is, 2,000 mg or more) has no further known benefit.

Fat and cancer: To carry this claim, a food must meet the nutrient content claim requirements for "low-fat" or, if fish and game meats, for "extra lean."

Saturated fat and cholesterol and coronary heart disease (CHD): This claim may be used if the food meets the definitions for the nutrient content claim "low saturated fat," "low-cholesterol," and "low-fat," or, if fish and game meats, for "extra lean." It may mention the link between reduced risk of CHD and lower saturated fat and cholesterol intakes to lower blood cholesterol levels.

Fiber-containing grain products, fruits and vegetables and cancer: To carry this claim, a food must be or must contain a grain product, fruit or vegetable and meet the nutrient content claim requirements for "low-fat," and, without fortification, be a "good source" of dietary fiber.

Fruits, vegetables and grain products that contain fiber and risk of CHD: To carry this claim, a food must be or must contain fruits, vegetables and grain products. It also must meet the nutrient content claim requirements for "low saturated fat," "low-cholesterol," and "low-fat" and contain, without fortification, at least 0.6 g soluble fiber per serving.

Sodium and hypertension (high blood pressure): To carry this claim, a food must meet the nutrient content claim requirements for "low-sodium."

Fruits and vegetables and cancer: This claim may be made for fruits and vegetables that meet the nutrient content claim requirements for "low-fat" and that, without fortification, for "good source" of at least one of the following: dietary fiber or vitamins A or C. This claim relates diets low in fat and rich in fruits and vegetables (and thus vitamins A and C and dietary fiber) to reduced cancer risk. FDA authorized this claim in place of an antioxidant vitamin and cancer claim.

Folic acid and neural tube defects: Folic acid and neural tube defects: This claim is allowed on dietary supplements that contain sufficient folate and on conventional foods that are naturally good sources of folate, as long as they do not provide more than 100 percent of the Daily Value for vitamin A as retinol or preformed vitamin A or vitamin D. A sample claim is "healthful diets with adequate folate may reduce a woman's risk of having a child with a brain or spinal cord defect."

Dietary sugar alcohols and dental caries (cavities): This claim applies to food products, such as candy or gum, containing the sugar alcohols xylitol, sorbitol, mannitol, maltitol, isomalt, lactitol, hydrogenated starch hydrolysates, hydrogenated glucose syrups, or a combination of any of these. If the food also contains a fermentable carbohydrate, such as sugar, the food cannot lower the pH of plaque in the mouth below 5.7. Besides the food ingredient's relationship to dental caries, the claim also must state that frequent between-meal consumption of foods high in sugars and starches promotes tooth decay. A shortened claim is allowed on food packages with less than 15 square inches of labeling surface area.

Soluble fiber from certain foods, such as whole oats and psyllium seed husk, and heart disease: This claim must state that the fiber also needs to be part of a diet low in saturated fat and cholesterol, and the food must provide sufficient soluble fiber. The amount of soluble fiber in a serving of the food must be listed on the Nutrition Facts panel.
Trends in Portion Sizes

More than 60 percent of adults in the U.S. are overweight or obese, and there are twice as many overweight children and three times as many overweight teens as there were two decades ago. Part of the problem is that Americans are eating more and physical activity has not increased to maintain energy balance. Between 1970 and the late 1990s, the daily food supply in America increased by 500 calories. Although food supply is an overestimation of what people eat, dietary intake surveys show an average increase of more than 200 calories per day. Even small increases in calories can translate into significant weight gain. One contributing factor is an increase in portion sizes.

“Portion size” is defined as the amount of food one chooses to eat. There are no standards for portion sizes. On the other hand, a “serving size” is a standard amount that gives guidance as to how much to eat or identifies how many calories and nutrients are in a food. The MyPyramid provides serving size recommendations to guide people in selecting their daily food intake. For example, one half cup of spaghetti (just the pasta) is one serving from the Grain Group. If you eat two cups of spaghetti for dinner, you are actually eating four servings. Depending on age, gender and activity level, this could amount to one-third to two-thirds of the daily recommendation for the Grain Group. While there is nothing wrong with eating a “portion size” that is more than one serving, it is important to know the difference between a portion and a serving. If you eat a portion that is actually several servings, you need to balance that with the other foods eaten in the day. The portion sizes of a majority of foods sold for immediate consumption far exceed the MyPyramid serving sizes. Indeed, our perception of what a serving size is has been altered by the increasing availability and marketing of larger food portions.

The introduction of larger-size portions in away-from home and marketplace foods has increased significantly. Bagels used to weigh between 2-3 ounces. Today, the average bagel weighs 4-7 ounces. The eight-ounce soft drink has become 20 ounces and the average theater serving of popcorn has gone from three cups to 16 cups. A typical hamburger in 1957 contained a little more than one ounce of cooked meat, compared to as much as six ounces in 1997. The trend toward larger portion sizes is most evident in restaurants and fast food outlets but is also significant in homes. One example is observed in recipes used at home. Newer editions of classic cookbooks such as The Joy of Cooking contain recipes identical to earlier versions, but yield fewer and therefore, larger portions than before.

Meal combos or value meals have become increasingly popular. Fast food chains offer more food for only a slight increase in cost. This supersizing of meals encourages Americans to buy and eat more food under the premise that it is a good value. For only 29¢ - 49¢, a fast food meal is supersized by as much as 400 calories. Super-combo meals, which include a large drink and fries, are often less expensive than the same sandwich with a small drink and fries. Fast food chains are not the only eating establishments increasing portion sizes. Many restaurant orders are so large that the MyPyramid daily recommendations for some food groups can be met in a single meal. Larger portion sizes can easily shift a healthful meal to one of excessive calories, fat, sugar and sodium.

Children are not immune to the increase in portion sizes. Fast food chains are now targeting children ages 7 to 12 with supersized versions of their popular kids’ meals. By increasing the regular hamburger to a double hamburger or double cheeseburger, the calorie content of the meal increases by 100-180 calories.

In the past, many people considered eating out to be a special treat. Indulging in a large meal at a restaurant or fast food outlet was easily balanced with more moderate meals eaten throughout the week. However, several societal shifts – such as an increase of women in the workforce, dual-income households and smaller household sizes – have increased the demand for foods prepared away from home. In addition, away-from-home foods are now more affordable and accessible than ever before. Away-from-home food consumption has increased by two-thirds from 1977 to 1995. Half of the meals eaten away from home are fast foods. As children get older, the proportion of meals eaten away from home increases from 18 percent in preschoolers to 30 percent in adolescents.

What foods are in the fruit group?

Any fruit or 100% fruit juice counts as part of the fruit group. Fruits may be fresh, canned, frozen, or dried, and may be whole, cut-up, or pureed. Some commonly eaten fruits are:

- Apples
- Apricots
- Avocado
- Bananas
- Berries: strawberries, blueberries, raspberries, cherries
- Grapefruit
- Grapes
- Kiwi fruit
- Lemons
- Limes
- Mangoes
- Melons: cantaloupe, honeydew, watermelon
- Mixed fruits: fruit cocktail
- Nectarines
- Oranges
- Peaches
- Pears
- Papaya
- Pineapple
- Plums
- Prunes
- Raisins
- Tangerines
- 100% Fruit juice: orange, apple, grape, grapefruit
- Mixed fruits: fruit cocktail

Why is it important to eat fruit?

Eating fruit provides health benefits — people who eat more fruits and vegetables as part of an overall healthy diet are likely to have a reduced risk of some chronic diseases. Fruits provide nutrients vital for health and maintenance of your body.

Health benefits

- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for stroke and perhaps other cardiovascular diseases.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for type 2 diabetes.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may protect against certain cancers, such as mouth, stomach, and colon-rectum cancer.
- Diets rich in foods containing fiber, such as fruits and vegetables, may reduce the risk of coronary heart disease.
- Eating fruits and vegetables rich in potassium as part of an overall healthy diet may reduce the risk of developing kidney stones and may help to decrease bone loss.
- Eating foods such as fruits that are low in calories per cup instead of some other higher-calorie food may be useful in helping to lower calorie intake.

Nutrients

- Most fruits are naturally low in fat, sodium, and calories. None have cholesterol.
- Fruits are important sources of many nutrients, including potassium, dietary fiber, vitamin C and folate (folic acid).
- Diets rich in potassium may help to maintain healthy blood pressure. Fruit sources of potassium include bananas, prunes and prune juice, dried peaches and apricots, cantaloupe, honeydew melon, and orange juice.
- Dietary fiber from fruits, as part of an overall healthy diet, helps reduce blood cholesterol levels and may lower risk of heart disease. Fiber is important for proper bowel function. It helps reduce constipation and diverticulosis. Fiber-containing foods such as fruits help provide a feeling of fullness with fewer calories. Whole or cut-up fruits are sources of dietary fiber; fruit juices contain little or no fiber.

Source: www.MyPyramid.gov
- Vitamin C is important for growth and repair of all body tissues, helps heal cuts and wounds, and keeps teeth and gums healthy.
- Folate (folic acid) helps the body form red blood cells. Women of childbearing age who may become pregnant and those in the first trimester of pregnancy should consume adequate folate, including folic acid from fortified foods or supplements. This reduces the risk of neural tube defects, spina bifida, and anencephaly during fetal development.

How much fruit is needed daily?

The amount of fruit you need to eat depends on age, sex, and level of physical activity. Recommended daily amounts are shown in the chart. Recommended amounts are shown in the table below.

<table>
<thead>
<tr>
<th>Children</th>
<th></th>
<th></th>
<th>2-3 years old</th>
<th>1 cup</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>4-8 years old</td>
<td>1 to 1½ cups</td>
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<tr>
<td>Girls</td>
<td>9-13 years old</td>
<td>1 ½ cups</td>
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<td></td>
<td>14-18 years old</td>
<td>1½ cups</td>
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<tr>
<td>Boys</td>
<td>9-13 years old</td>
<td>1½ cups</td>
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<td>14-18 years old</td>
<td>2 cups</td>
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<tr>
<td>Women</td>
<td>19-30 years old</td>
<td>2 cups</td>
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<td></td>
<td>31-50 years old</td>
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<td></td>
<td>51+ years old</td>
<td>1½ cups</td>
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<tr>
<td>Men</td>
<td>19-30 years old</td>
<td>2 cups</td>
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<td></td>
<td>51+ years old</td>
<td>2 cups</td>
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</table>

What counts as a cup of fruit?

In general, 1 cup of fruit or 100% fruit juice, or ½ cup of dried fruit can be considered as 1 cup from the fruit group.

Tips to help you eat fruits

In general:
- Keep a bowl of whole fruit on the table, counter or in the refrigerator.
- Refrigerate cut-up fruit to store for later.
- Buy fresh fruits in season when they may be less expensive and at their peak flavor.
- Buy fruits that are dried, frozen, and canned (in water or juice) as well as fresh, so that you always have a supply on hand.
- Consider convenience when shopping. Buy pre-cut packages of fruit (such as melon or pineapple chunks) for a healthy snack in seconds. Choose packaged fruits that do not have added sugars.

For the best nutritional value:
- Make most of your choices whole or cut-up fruit rather than juice, for the benefits dietary fiber provides.
- Select fruits with more potassium often, such as bananas, prunes and prune juice, dried peaches and apricots, cantaloupe, honeydew melon, and orange juice.
- When choosing canned fruits, select fruit canned in 100% fruit juice or water rather than syrup.
- Vary your fruit choices. Fruits differ in nutrient content.

At meals:
- At breakfast, top your cereal with bananas or peaches; add blueberries to pancakes; drink 100% orange or grapefruit juice. Or, try a fruit mixed with low-fat or fat-free yogurt.
- At lunch, pack a tangerine, banana, or grapes to eat, or choose fruits from a salad bar. Individual containers of fruits like peaches or applesauce are easy and convenient.
- At dinner, add crushed pineapple to coleslaw, or include mandarin oranges or grapes in a tossed salad.

Source: www.MyPyramid.gov
• Make a Waldorf salad, with apples, celery, walnuts, and dressing.
• Try meat dishes that incorporate fruit, such as chicken with apricots or mango chutney.
• Add fruit like pineapple or peaches to kabobs as part of a barbecue meal.
• For dessert, have baked apples, pears, or a fruit salad.

As snacks:
• Cut-up fruit makes a great snack. Either cut them yourself, or buy pre-cut packages of fruit pieces like pineapples or melons. Or, try whole fresh berries or grapes.
• Dried fruits also make a great snack. They are easy to carry and store well. Because they are dried, ¼ cup is equivalent to ½ cup of other fruits.
• Keep a package of dried fruit in your desk or bag. Some fruits that are available dried include apricots, apples, pineapple, bananas, cherries, figs, dates, cranberries, blueberries, prunes (dried plums), and raisins (dried grapes).
• As a snack, spread peanut butter on apple slices or top frozen yogurt with berries or slices of kiwi fruit.
• Frozen juice bars (100% juice) make healthy alternatives to high-fat snacks.

Make fruit more appealing:
• Many fruits taste great with a dip or dressing. Try low-fat yogurt or pudding as a dip for fruits like strawberries or melons.
• Make a fruit smoothie by blending fat-free or low-fat milk or yogurt with fresh or frozen fruit. Try bananas, peaches, strawberries, or other berries.
• Try applesauce as a fat-free substitute for some of the oil when baking cakes.
• Try different textures of fruits. For example, apples are crunchy, bananas are smooth and creamy, and oranges are juicy.
• For fresh fruit salads, mix apples, bananas, or pears with acidic fruits like oranges, pineapple, or lemon juice to keep them from turning brown.

Fruit tips for children:
• Set a good example for children by eating fruit everyday with meals or as snacks.
• Offer children a choice of fruits for lunch.
• Depending on their age, children can help shop for, clean, peel, or cut up fruits.
• While shopping, allow children to pick out a new fruit to try later at home.
• Decorate plates or serving dishes with fruit slices.
• Top off a bowl of cereal with some berries. Or, make a smiley face with sliced bananas for eyes, raisins for a nose, and an orange slice for a mouth.
• Offer raisins or other dried fruits instead of candy.
• Make fruit kabobs using pineapple chunks, bananas, grapes, and berries.
• Pack a juice box (100% juice) in children’s lunches versus soda or other sugar-sweetened beverages.
• Choose fruit options, such as sliced apples, mixed fruit cup, or 100% fruit juice that are available in some fast food restaurants.
• Offer fruit pieces and 100% fruit juice to children. There is often little fruit in “fruit-flavored” beverages or chewy fruit snacks.

Keep it safe:
• Wash fruits before preparing or eating them. Under clean, running water, rub fruits briskly with your hands to remove dirt and surface microorganisms. Dry after washing.
• Keep fruits separate from raw meat, poultry and seafood while shopping, preparing, or storing.

Source: www.MyPyramid.gov
What foods are in the vegetable group?

Any vegetable or 100% vegetable juice counts as a member of the vegetable group. Vegetables may be raw or cooked; fresh, frozen, canned, or dried/dehydrated; and may be whole, cut-up, or mashed. Vegetables are organized into 5 subgroups, based on their nutrient content. Some commonly eaten vegetables in each subgroup are:

### Dark green vegetables
- bok choy
- broccoli
- collard greens
- dark green leafy lettuce
- kale
- mesclun
- mustard greens
- romaine lettuce
- spinach
- turnip greens
- watercress

### Orange vegetables
- acorn squash
- butternut squash
- carrots
- hubbard squash
- pumpkin
- sweet potatoes

### Dry beans and peas
- black beans
- black-eyed peas
- garbanzo beans (chickpeas)
- kidney beans
- lentils
- lima beans (mature)
- navy beans
- pinto beans
- soy beans
- split peas
- tofu (bean curd made from soybeans)
- white beans

### Starchy vegetables
- corn
- green peas
- lima beans (green)
- potatoes

### Other vegetables
- artichokes
- asparagus
- bean sprouts
- beets
- Brussels sprouts
- cabbage
- cauliflower
- celery
- cucumbers
- eggplant
- green beans
- green or red peppers
- iceberg (head) lettuce
- mushrooms
- okra
- onions
- parsnips
- tomatoes
- tomato juice
- vegetable juice
- turnips
- wax beans
- zucchini

Why is it important to eat vegetables?

Eating vegetables provides health benefits — people who eat more fruits and vegetables as part of an overall healthy diet are likely to have a reduced risk of some chronic diseases. Vegetables provide nutrients vital for health and maintenance of your body.

**Health benefits**
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for stroke and perhaps other cardiovascular diseases.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may reduce risk for type 2 diabetes.
- Eating a diet rich in fruits and vegetables as part of an overall healthy diet may protect against certain cancers, such as mouth, stomach, and colon-rectum cancer.
- Diets rich in foods containing fiber, such as fruits and vegetables, may reduce the risk of coronary heart disease.
- Eating fruits and vegetables rich in potassium as part of an overall healthy diet may reduce the risk of developing kidney stones and may help to decrease bone loss.
- Eating foods such as vegetables that are low in calories per cup instead of some other higher-calorie food may be useful in helping to lower calorie intake.

Source: www.MyPyramid.gov
Nutrients

• Most vegetables are naturally low in fat and calories. None have cholesterol. (Sauces or seasonings may add fat, calories, or cholesterol.)

• Vegetables are important sources of many nutrients, including potassium, dietary fiber, folate (folic acid), vitamin A, vitamin E and vitamin C.

• Diets rich in potassium may help to maintain healthy blood pressure. Vegetable sources of potassium include sweet potatoes, white potatoes, white beans, tomato products (paste, sauce, and juice), beet greens, soybeans, lima beans, winter squash, spinach, lentils, kidney beans, and split peas.

• Dietary fiber from vegetables, as part of an overall healthy diet, helps reduce blood cholesterol levels and may lower risk of heart disease. Fiber is important for proper bowel function. It helps reduce constipation and diverticulosis. Fiber-containing foods such as vegetables help provide a feeling of fullness with fewer calories.

• Folate (folic acid) helps the body form red blood cells. Women of childbearing age who may become pregnant and those in the first trimester of pregnancy should consume adequate folate, including folic acid from fortified foods or supplements. This reduces the risk of neural tube defects, spina bifida, and anencephaly during fetal development.

• Vitamin A keeps eyes and skin healthy and helps to protect against infections.

• Vitamin E helps protect vitamin A and essential fatty acids from cell oxidation.

• Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy. Vitamin C aids in iron absorption.

How many vegetables are needed daily or weekly?

Vegetable choices should be selected from among the vegetable subgroups. It is not necessary to eat vegetables from each subgroup daily. However, over a week, try to consume the amounts listed from each subgroup as a way to reach your daily intake recommendation. The amount of vegetables you need to eat depends on your age, sex, and level of physical activity. Recommended total daily amounts are shown in the chart below.

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<th>Children</th>
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<td>9-13 years old</td>
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<tr>
<td>51+ years old</td>
<td>2½ cups</td>
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</tr>
</tbody>
</table>

What counts as a cup of vegetables?

In general, 1 cup of raw or cooked vegetables or vegetable juice, or 2 cups of raw leafy greens can be considered as 1 cup from the vegetable group.

Tips to help you eat vegetables

In general:

• Buy fresh vegetables in season. They cost less and are likely to be at their peak flavor.

• Stock up on frozen vegetables for quick and easy cooking in the microwave.

• Buy vegetables that are easy to prepare. Pick up pre-washed bags of salad greens and add baby carrots or grape tomatoes for a salad in minutes. Buy packages of baby carrots or celery sticks for quick snacks.

• Use a microwave to quickly “zap” vegetables. White or sweet potatoes can be baked quickly this way.

• Vary your veggie choices to keep meals interesting.

• Try crunchy vegetables, raw or lightly steamed.
For the best nutritional value:

- Select vegetables with more potassium often, such as sweet potatoes, white potatoes, white beans, tomato products (paste, sauce, and juice), beet greens, soybeans, lima beans, winter squash, spinach, lentils, kidney beans, and split peas.
- Sauces or seasonings can add calories, fat, and sodium to vegetables. Use the Nutrition Facts label to compare the calories and % Daily Value for fat and sodium in plain and seasoned vegetables.
- Prepare more foods from fresh ingredients to lower sodium intake. Most sodium in the food supply comes from packaged or processed foods.
- Buy canned vegetables labeled “no salt added.” If you want to add a little salt it will likely be less than the amount in the regular canned product.

At meals:

- Plan some meals around a vegetable main dish, such as a vegetable stir-fry or soup. Then add other foods to complement it.
- Try a main dish salad for lunch. Go light on the salad dressing.
- Include a green salad with your dinner every night.
- Shred carrots or zucchini into meatloaf, casseroles, quick breads, and muffins.
- Include chopped vegetables in pasta sauce or lasagna.
  - Order a veggie pizza with toppings like mushrooms, green peppers, and onions, and ask for extra veggies.
  - Use pureed, cooked vegetables such as potatoes to thicken stews, soups and gravies. These add flavor, nutrients, and texture.
  - Grill vegetable kabobs as part of a barbecue meal. Try tomatoes, mushrooms, green peppers, and onions.

Make vegetables more appealing:

- Many vegetables taste great with a dip or dressing. Try a low-fat salad dressing with raw broccoli, red and green peppers, celery sticks or cauliflower.
- Add color to salads by adding baby carrots, shredded red cabbage, or spinach leaves. Include in-season vegetables for variety through the year.
- Include cooked dry beans or peas in flavorful mixed dishes, such as chili or minestrone soup.
- Decorate plates or serving dishes with vegetable slices.
- Keep a bowl of cut-up vegetables in a see-through container in the refrigerator. Carrot and celery sticks are traditional, but consider broccoli florets, cucumber slices, or red or green pepper strips.

Vegetable tips for children:

- Set a good example for children by eating vegetables with meals and as snacks.
- Let children decide on the dinner vegetables or what goes into salads.
- Depending on their age, children can help shop for, clean, peel, or cut up vegetables.
- Allow children to pick a new vegetable to try while shopping.
- Use cut-up vegetables as part of afternoon snacks.
- Children often prefer foods served separately. So, rather than mixed vegetables try serving two vegetables separately.

Keep it safe:

- Wash vegetables before preparing or eating them. Under clean, running water, rub vegetables briskly with your hands to remove dirt and surface microorganisms. Dry after washing.
- Keep vegetables separate from raw meat, poultry and seafood while shopping, preparing or storing.

Source: www.MyPyramid.gov
Water

Water is the most abundant substance in the human body as well as the most common substance on earth. Like oxygen, you cannot live without water. On average, body weight is 50 to 75% water or about 10-12 gallons. Water is a simple substance containing two parts hydrogen and one part oxygen (H₂O). It has no calories, but every body process needs water to function.

Water regulates your body temperature, keeping it constant at about 98.6 F. Many body processes produce heat, including any physical activity. Through perspiration, heat escapes from your body as water evaporates on your skin.

- Water transports nutrients and oxygen to your cells and carries waste products away.
- Water helps with the digestion of foods.
- Water moistens body tissues such as those in your mouth, eyes and nose.
- Water is the main part of every body fluid including blood, stomach juices and urine.
- Water helps cushion your joints and protects your body’s organs and tissues.

Of all the nutrients in the body, water is the most abundant. Water and other beverages are the main sources. But you also eat quite a bit of water in solid foods. Juicy fruits and vegetables such as celery, lettuce, tomatoes and watermelon contain more than 90% water. Even dry foods such as bread supply some water.

The average adult loses about two quarts of water daily through perspiration, urination, bowel movements and even breathing. One and one-half cups of water is lost just through breathing. Most people need 8 to 12 cups of water daily from drinking water and other beverages.

When we are really active outside in the hot weather we need to be especially careful to avoid dehydration. No matter what you do - biking, running, swimming, walking or just playing outside - make sure you get enough fluids.

- Drink plenty of fluids before, during and after activity. Carry a water bottle especially if you do not have a water source available.
- Drink fluids by schedule (every fifteen minutes) even when you do not feel thirsty.
- Wear light colored clothing.
- Be especially careful if you exercise in warm, humid weather.
- Signs of dehydration are flushed skin, fatigue, increased body temperature and increased breathing and pulse rate.
# Food Advertising Strategies

Advertisers have many methods to try and get you to buy their products. Lots of times, what they are selling is a lifestyle, or an image, rather than the product. Here are some tricks of the trade.

<table>
<thead>
<tr>
<th>Ideal Kids (or families)</th>
<th>Heart Strings</th>
</tr>
</thead>
<tbody>
<tr>
<td>- always seem perfect.</td>
<td>- are ads that draw you into a story and make you feel good, like the McDonalds commercial where the dad and his son are shoveling their driveway and the son treats his poor old dad to lunch at McDonalds when they are done.</td>
</tr>
<tr>
<td>The kids are really hip looking, with the hottest fashions and haircuts, and toys. Ideal families are all attractive and pleasant looking -- and everyone seems to get along! Ideal kids and families represent the types of people that kids watching the ad would like themselves or their families to be.</td>
<td></td>
</tr>
<tr>
<td>Family Fun - a product is shown as something that brings families together, or helps them have fun together; all it takes is for mom or dad to bring home the &quot;right&quot; food, and a ho-hum dinner turns into a family party.</td>
<td></td>
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<tr>
<td>Excitement - who could ever have imagined that food could be so much fun? One bite of a snack food and you're surfing in California, or soaring on your skateboard!</td>
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<tr>
<td>Star Power - your favorite sports star or celebrity is telling you that their product is the best! Kids listen, not realizing that the star is being paid to promote the product.</td>
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<tr>
<td>Bandwagon - join the crowd! Don't be left out! Everyone is buying the latest snack food: aren't you?</td>
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<tr>
<td>Scale - is when advertisers make a product look bigger or smaller than it actually is.</td>
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<tr>
<td>Put Downs - are when you put down your competition's product to make your own product seem better.</td>
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<tr>
<td>Facts and Figures - are when you use facts and statistics to enhance your product's credibility.</td>
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</tr>
<tr>
<td>Repetition - advertisers hope that if you see a product, or hear it's name over and over again, you will be more likely to buy it. Sometimes the same commercial will be repeated over and over again.</td>
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</tr>
<tr>
<td>Cartoon Characters - Tony the Tiger sells cereal and the Nestlé's Quick Bunny sells chocolate milk. Cartoons like these make kids identify with products.</td>
<td></td>
</tr>
<tr>
<td>Weasel Words - by law, advertisers have to tell the truth, but sometimes, they use words that can mislead viewers. Look for words in commercials like: &quot;Part of...&quot; &quot;The taste of real.....&quot; &quot;Natural....&quot; &quot;New, better tasting.....&quot; &quot;Because we care...&quot; There are hundreds of these deceptive sayings -- how many more can you think of?</td>
<td></td>
</tr>
<tr>
<td>Omission - is where advertisers don't give you the full story about their product. For example, when a Pop Tart claims to be &quot;part&quot; of a healthy breakfast, it doesn't mention that the breakfast might still be healthy whether this product is there or not.</td>
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</tr>
<tr>
<td>Are You Cool Enough? - this is when advertisers try to convince you that if you don't use their products, you are a nerd. Usually advertisers do this by showing people that look uncool trying a product and then suddenly becoming hip looking and doing cool things.</td>
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</tr>
</tbody>
</table>

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Source: Media Awareness Network
Lesson Plans

Grade 4

The Digestive System
Keeping Food Safe to Eat
Food Labels and Serving Sizes
Planning Healthy Meals and Snacks
Portion Sizes
Water, Water Everywhere
Tuning in to Good Nutrition
Grade 4

The Digestive System

Healthful Living Objective
4.01 Identify the major components of the digestive system and summarize the digestive process.

Math Objective
1.01 Develop a sense of rational numbers 0.01 through 99,999.

English Language Arts Objective
Goal 4 The learner will apply strategies and skills to create oral, written and visual text.

Materials Needed
• Unsalted saltine crackers (one per student)
• Apples (enough for each student to have ½ of an apple)
• Pitcher of ice water
• Small paper cups (one per student)
• Orange
• Panty hose leg (narrowest part)
• Two large sheets of paper
• Tape measure
• String (at least 50 feet in length)
• Glue

Teacher Resources
• Digestive Diagram – made into an overhead transparency
• Digestion Process

Handouts
• Chewing Your Chow
• The Saliva Solution

Focus
Give each student a small piece of cracker and tell them to take a small bite. Ask them not to chew or swallow the cracker, just hold it in their mouths. Ask the following questions:
• What happened to the cracker when it was in your mouth?
• Why did it start to get softer?
• What did you taste?
• Wait a few minutes, then ask: Has the taste has changed? Did it become sweet?
• Did the cracker get soft in your mouth even if you were not chewing?

Teacher Input
Using the Digestion Process teacher resource, explain the digestive process and the role of the digestive system. NOTE: consider presenting the material one section at a time as outlined in the resource and doing the corresponding practice and assessment activity before moving to the next section.
Practice and Assessment

**Teeth:** Distribute the *Chewing Your Chow* handout and provide each student with ½ of an apple. As a class, do the activities and instruct students to record their responses.

**Saliva:** Distribute and direct students to complete *The Saliva Solution* handout. Discuss answers with students.

**Swallowing:** Give each student a cup of ice-cold water. Instruct them to drink and feel the cold water travel down the esophagus.

**Stomach and intestines:** Ask for two or more volunteers. Trace the students’ bodies onto large sheets of paper. Using the *Digestive Diagram* teacher resource as a reference, direct students to work in teams to draw and label parts of the digestive system into their life-sized silhouettes. The digestive tract is more than 25 feet long in a child who is four feet tall. Using a tape measure, instruct students to measure two 25-foot lengths of string. Direct them to fit and glue the “digestive tract” into their drawings.
Chewing Your Chow!

The process of digestion starts in your mouth. Your teeth tear and grind food into smaller pieces.

1. Take a bite of an apple.
   
   Which teeth did you use to bite?_________________
   
   Which teeth did you use to chew?_________________

2. What if your teeth switched jobs? Take another bite of the apple. Try to chew using your incisors (front teeth). Do incisors do a good chewing job? Why or why not?

3. Bite the apple using only your molars (back teeth). Were you able to get a good chunk of the apple without your incisors? Why or why not?

4. Which teeth do the most work when you eat? Take another bite and find out.
Chewing Your Chow!

The process of digestion starts in your mouth. Your teeth tear and grind food into smaller pieces.

1. Take a bite of an apple.

   Which teeth did you use to bite?  **Incisors or front teeth**

   Which teeth did you use to chew?  **Molars or back teeth**

2. What if your teeth switched jobs? Take another bite of the apple. Try to chew using your incisors (front teeth). Do incisors do a good chewing job? Why or why not?

   **Incisors do not chew well. They do not have a broad surface to grind foods.**

3. Bite the apple using only your molars (back teeth). Were you able to get a good chunk of the apple without your incisors? Why or why not?

   **It’s hard to bite a chunk with molars because the cheeks get in the way.**

4. Which teeth do the most work when you eat? Take another bite and find out.

   **When you eat, molars do the most work, crushing food to make it easier to swallow and digest.**
The Saliva Solution

The teeth physically break food into smaller pieces. At the same time, your saliva chemically breaks it down as well. How does this happen? Saliva contains special chemicals called enzymes to break down large starch molecules.

1. What happened when you held a saltine cracker in your mouth? Did you notice any change in the cracker? What do you think is happening to the starch in the cracker?

2. How does saliva help us digest our food?
The Saliva Solution

The teeth physically break food into smaller pieces. At the same time, your saliva chemically breaks it down as well. How does this happen? Saliva contains special chemicals called enzymes to break down large starch molecules.

1. What happened when you held a saltine cracker in your mouth? Did you notice any change in the cracker? What do you think is happening to the starch in the cracker?

   **The cracker started to taste sweeter. The starch is turning to sugar so the cracker starts to taste sweet.**

2. How does saliva help us digest our food?

   **Saliva helps us digest our food by making it wet and easier to swallow and by changing start to sugar.**
Grade 4

Keeping Food Safe to Eat

Healthful Living Objective
4.02 Analyze how microorganisms can cause food-borne illnesses and demonstrate safe food preparation, handling, cooking and storing that promotes cleanliness and avoids cross contamination.

Math Objectives
1.02 Develop fluency with multiplication and division:
   • Two-digit by two-digit multiplication (larger numbers with calculator)
   • Up to three-digit by two-digit division (larger numbers with calculator)
   • Strategies for multiplying and dividing numbers
   • Estimation of products and quotients in appropriate situations
   • Relationships between operations
1.05 Develop flexibility in solving problems by selecting strategies and using mental computation, estimation, calculators or computers, and paper and pencil.
5.01 Identify, describe, and generalize relationships in which:
   • Quantities change proportionally
   • Change in one quantity relates to change in a second quantity

English Language Arts Objectives
1.01 Use word identification strategies appropriately and automatically when encountering unknown words (graphophonic, syntactic, semantic).
1.03 Identify key words and discover their meanings and relationships through a variety of strategies.
1.05 Use word reference materials (e.g., glossary, dictionary, thesaurus) to identify and comprehend unknown words.
3.06 Conduct research for assigned projects or self-selected projects (with assistance) from a variety of sources through the use of technological and informal tools (e.g., print and non-print texts, artifacts, people, libraries, databases, computer networks).
4.06 Compose a draft that conveys major ideas and maintains focus on the topic with specific, relevant, supporting details by using preliminary plans.
4.07 Compose fiction, nonfiction, poetry, and drama using self-selected and assigned topics and forms (e.g., personal and imaginative narratives, research reports, diaries, journals, logs, rules, instructions).
4.10 Use technology as a tool to gather, organize, and present information.

Teacher Resources
• Most Wanted Fact Sheets
• Four Simple Steps to Food Safety

Materials Needed
• Calculators
• Cooking oil
• Cinnamon
• Access to hand washing
• Hot water
• Measuring cup
• One shallow and one tall container (1 cup minimum) made from the same material (glass or plastic)
• Food thermometer
Handouts
• Multiplying Germs: They’re Everywhere
• FBI Case: Perils at the Picnic
• Soapy Solutions
• Cooling Counts

Focus
Tell students to imagine a fictional germ:
• It doubles once every hour at room temperature (70°F/21°C)
• It doubles once every 6 hours when cooled in the refrigerator (35°F/4°C)
• It doubles once every 4 hours when heated in the oven (120°F/49°C).
Instruct students to estimate how many germs would be present in 24 hours in each of the three environments.
ANSWERS:
• room temperature - 16,777,216
• refrigerator - 16
• oven - 128

Teacher Input
Using the Most Wanted Fact Sheets and Four Simple Steps to Food Safety teacher resources, discuss food-borne illnesses and how to keep food safe.

Practice and Assessment
Distribute and direct students to complete the Multiplying Germs (They’re Everywhere!) handout.
OPTIONAL: Create a chart as a class with the calculations. NOTE: The answer for room temperature after two days is larger than 99,999. This is beyond the standard course of study competencies for Grade 4. In addition, standard calculators may not be able to accommodate the solution.

Distribute and direct students to complete the FBI (Food Borne Illness) Case: Perils at the Picnic handout.

As a class, conduct the experiments outlined in the Soapy Solutions and Cooling Counts handouts.

Instruct students to write a report on the findings from the experiments. Direct them to follow the general outline for writing a lab report to include: problem, hypothesis, materials, procedure, observation, conclusion and questions for further investigation.
## Multiplying Germs
(They’re Everywhere!)

Remember the fictional germ we just talked about? One germ doubles every hour at room temperature (70°F/21°C). It doubles every 6 hours in the refrigerator (40°F/4°C). It doubles every 4 hours when heated in the oven (120°F/49°C). We have already calculated how many germs there would be in 24 hours. Fill in the following table to find out how many germs there will be at the times given.

<table>
<thead>
<tr>
<th>Location</th>
<th>1 hour</th>
<th>2 hours</th>
<th>4 hours</th>
<th>6 hours</th>
<th>8 hours</th>
<th>12 hours</th>
<th>2 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(70°F/21°C)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerator</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>(40°F/4°C)</td>
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</tr>
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<td>Oven</td>
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<tr>
<td>(120°F/49°C)</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Which location has the most germs for the times given?

How do you think temperature affects how fast germs grow?
Remember the fictional germ we just talked about? One germ doubles every hour at room temperature (70°F/21°C). It doubles every 6 hours in the refrigerator (40°F/4°C). It doubles every 4 hours when heated in the oven (120°F/49°C). We have already calculated how many germs there would be in 24 hours. Fill in the following table to find out how many germs there will be at the times given.

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<th>6 hours</th>
<th>8 hours</th>
<th>12 hours</th>
<th>2 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room Temperature</td>
<td>2</td>
<td>4</td>
<td>16</td>
<td>64</td>
<td>256</td>
<td>4096</td>
<td></td>
</tr>
<tr>
<td>(70°F/21°C)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerator</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>256</td>
</tr>
<tr>
<td>(40°F/4°C)</td>
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<tr>
<td>Oven</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>16</td>
<td>8,192</td>
</tr>
<tr>
<td>(120°F/49°C)</td>
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</tbody>
</table>

Which location has the most germs for the times given?

**Room temperature**

How do you think temperature affects how fast germs grow?

**Germs do not multiply as quickly at lower and higher temperatures. They grow fastest at room temperature.**
FBI* CASE: Perils at the Picnic

Calling all agents! The FBI Team has learned of a possible foodborne illness incident in progress!

As an FBI detective, you must investigate the facts and give your expert conclusions. Because now that you’re an expert on food safety — it’s up to you to Fight BAC!® for food safety!

*FBI = foodborne illness

It was a Saturday morning in early summer . . .

1. Tom gets a call from his friends to meet them in the park down the street to play ball. They tell him to bring food for a picnic lunch, so they can stay all day. (One of his buddies, Nick, is bringing his older brother along to help with the barbecue.) The boys can’t wait to get to the park early so they can start playing before it gets too hot!

2. Tom looks in the refrigerator and finds some potato salad his mom made during the week. He also finds some cold cuts, leftover turkey, cheese, a tomato, an apple and some grapes in a drawer. He wraps the meat and cheese in plastic wrap and packs them in a big paper bag with some paper plates, bread, the fruit and tomato and a knife and fork. Just before he leaves, he checks the freezer and finds three hamburger patties wrapped in plastic — he throws them in the bag, too.

3. As Tom runs out the door, he tosses his baseball and glove in the bag and grabs his bat. When he gets to the park, several of his friends are already there. Nick’s older brother, Stephen, is setting up a grill for cooking hamburgers.

4. Tom and his friends claim the last picnic table — a great spot in the sun! Tom grabs his baseball and glove out of the food bag and leaves the bag on top of the table. He figures that this way, the hamburger will be thawed enough to cook by lunchtime!

5. When it’s time to break for lunch, Tom’s friends go to find a bathroom while Tom unpacks the picnic food. The hamburgers are dripping on the outside, but still frozen on the inside and stuck together! So Tom sets them on a paper plate and uses the knife and fork he brought to pry them apart. When they’re almost apart, he uses his fingers to separate them the rest of the way and then leaves them on the plate so they can thaw a bit more before he takes them over to the grill.

6. Tom then sets the cheese and the tomato on the plate and slices them to use on top of the burgers. That way everything will be ready to stick on top of the burgers!
What food safety mistakes did Tom make?

• At home?

• At the park before they played ball?

• While getting the food ready?

• While he and his friends were eating?

What questions do you have for Tom and his friends about what they did?

About the food they were eating?

Does it matter . . .

• How long Tom and his friends played ball?

• That Tom didn’t go to the bathroom with his friends?

• That they chose a table in the sun?

• That the hamburger was juicy on the outside when they finished playing ball?

Explain why:

What might happen to Tom and his friends?

When the other kids return, they brush off the surface of the picnic table with their hands and lay the bread out to make a couple of sandwiches from the cold cuts, cheese, and turkey. Nick’s brother starts grilling the burgers.

Once the burgers have turned brown on the outside, Tom and his friends add cheese to the top of the burgers. Stephen says he wants to cook them a bit more, but the boys insist that they love to eat them rare.

Retrieving the fork Tom used to separate the frozen burgers, the boys serve themselves some potato salad. Using the knife, they cut up the apple which had been sitting on top of the picnic table and share it along with the grapes, which had also been sitting out on the top of the picnic table.
**EXPERIMENT**

**SOAPY SOLUTIONS**

**Materials Needed:**
- Cooking oil
- Cinnamon
- Access to sink to wash hands
- Measuring spoons (teaspoon and tablespoon)

**QUESTION**
What is the most effective way to remove bacteria from your hands?

**MY HYPOTHESIS:**

---

**GETTING READY**
Ask three classmates to volunteer for the experiment.

**PROCEDURE**

**For the student volunteers:**
1. Rub 1 tablespoon of cooking oil all over your hands until completely coated. Sprinkle 1 teaspoon of cinnamon on hands and rub it around until it’s evenly distributed. The cinnamon will be like bacteria. It’s all over!
2. Wash hands as follows, rubbing them briskly for 20 seconds:
   - Student #1: wash hands with cold water and no soap
   - Student #2: wash hands with warm water and no soap
   - Student #3: wash hands with warm water and soap

**For the rest of the class:**
1. Observe the three handwashing methods.
2. Record the results.

**MY OBSERVATIONS**

- The method of handwashing that removed the most “bacteria” was:
- The method that removed the least “bacteria” was:
- Illustrate how the hands of Students 1, 2 and 3 looked after washing.

**MY CONCLUSIONS**

- I can remove bacteria from my hands by:
- If I used only cold water and no soap to wash, this is what might happen:
- Why does the . . .
  - Warm water help?
  - Soap?
  - Rubbing?

**TELL YOUR FAMILY**
Encourage all family members to wash hands with soap and warm water for 20 seconds.

Compliments of The Partnership for Food Safety Education

Visit our web site: www.fightbac.org
**COOLING COUNTS**

**Materials Needed:**
- Hot water
- Measuring cup
- Shallow container (1 cup/500 ml minimum)
- Tall container
- Food thermometer
- Wire or string

**QUESTION**
Does the shape of a container affect the rate at which cooling takes place?

**MY HYPOTHESIS:**

**PROCEDURE**
1. Pour 1 cup hot water into each container.
2. Check the temperature of the water in each container at 5-minute intervals, and record the times and temperatures. (See tip at left.)

**MY OBSERVATIONS**
- This is what I observed about the water cooling in each container:
  - Shallow:
  - Tall:
  - Chart the results for temperatures at 5-minute intervals.

**MY CONCLUSIONS**
- It took the taller container longer to cool because:
- It is important for leftover food to be cooled down quickly when stored in the refrigerator because:
- If the water were clam chowder and it took a long time to cool down, this is what could happen:

**RECOMMENDED Safe Cooking Temperatures**
These temperatures are recommended for consumer cooking. They are not intended for processing, institutional, or foodservice preparation.

**Did you know?**
Bacteria grow quickest in the “danger zone” — temperatures between 40°F/4°C and 140°F/60°C.

**Tell your family**
Check to see how leftovers are stored in your home. Encourage family members to use shallow containers.
Grade 4

Food Labels and Serving Sizes

Healthful Living Objective

4.03 Utilize the basic information on food labels to make decisions about the nutritional value of various foods.

Math Objectives

1.02 Develop fluency with multiplication and division.
1.05 Develop flexibility in solving problems by selecting strategies and using mental computation, estimation, calculators and paper and pencil.
4.01 Collect, organize and display data (including line graphs and bar graphs) to solve problems.

English Language Arts Objective

Goal 2 The learner will apply strategies and skills to comprehend text that is read, heard and viewed.

Teacher Resources

• Nutrition Facts Label
• Food Labels: Nutrient Content Claims
• Trends in Portion Sizes

Materials Needed

• Three or four cereal bowls
• Two boxes of cereal
• Measuring cups
• Poster board
• Nutrition Facts Labels from 5 or more cereal boxes
• Nutrition Facts Labels from 5 or more snack boxes
• Nutrition Facts Labels from 5 or more packaged a la carte snack items available in the cafeteria

Handouts

• Is Your Food a Healthy Choice?
• How to Calculate Percent of Calories from Fat
• Nutrient Search

Focus

Place two boxes of cereal, cereal bowls and measuring cups on a work space. Cover or remove the Nutrition Facts Label. Allow each student to pour an amount of cereal he/she would eat for breakfast. Direct students to measure and record how much they put into the bowl. After everyone has taken a turn, ask one student to read aloud the serving size found in the Nutrition Facts Label. Ask students if their portions were the same, more or less than the label serving. Direct each student to plot his/her portion amount on a poster-sized bar graph. Include a comparison bar that shows the serving size listed on the label.

Teacher Input

Using the Nutrition Facts Label, Food Labels: Nutrient Content Claims and Is It a Portion or a Serving? teacher resources, emphasize serving sizes and discuss how healthy food choices can be made by reading the Nutrition Facts Label. Include in the discussion the difference between nutrition facts and nutrient content claims.
Talking points for % Daily Value (% DV):
- % DV of 5% or less for a nutrient is considered low in that nutrient
- % DV of between 10-19% for a nutrient is considered a good source of that nutrient
- % DV of 20% or greater for a nutrient is considered high in that nutrient
- Healthier choices have a lower % DV for total fat, saturated fat, cholesterol and sodium and higher % DV for total carbohydrate, dietary fiber, vitamins A and C and calcium and iron

Practice and Assessment
Distribute the *Is Your Food A Healthy Choice?* handout. Instruct students to work in pairs and select a **Nutrition Facts Labels** from the cereal, snack or packaged a la carte snack items to complete the handout. Direct students to use *How to Calculate Percent of Calories from Fat* to determine the percent of calories from fat for the item. Direct students to develop a bar or circle graph comparing labels for the following:
- sugar in breakfast cereal
- total fat in snacks
- calories in packaged a la carte snack items

Distribute and instruct students to complete the **Nutrient Search** handout using the **Nutrition Facts Labels** from the cereal, snack or packaged a la carte snack items. As a class, discuss which snacks or cereals would provide the most fat and which snacks would be good sources of vitamin A, vitamin C, calcium or iron.
Is Your Food A Healthy Choice?

Use your Nutrition Facts Label to fill in the chart and answer the questions. See if your food is a healthy choice.

Name of food or snack ________________________________

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Servings Per Container</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount per Serving</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calories from Fat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Daily Value</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturated Fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Answer the following question using the Nutrition Facts Label from your food or snack.

1. What percent of calories are from fat? __________________

2. How many servings are in the package? __________________

3. How many grams of fiber does the food or snack have? ______________

4. How many grams of protein does the food or snack have? _______________

5. Does your food have any vitamin A? _________ If so, what is the percent? _______

6. Does your food have any calcium? __________ If so, what is the percent? __________

7. Does your food have any vitamin C? __________ If so, what is the percent? ________

8. Does your food have any iron? _____________ If so, what is the percent? ___________

Is this a good choice for a snack? __________

Why or why not? ________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
How to Calculate Percent of Calories from Fat

Calories in food come from carbohydrate, protein or fat. Fats have more calories than carbohydrates and proteins.

To stay healthy, you should try not to eat more than 35% of calories from fat for a day. It is okay to eat some foods that are high in fat. Just try to balance it. You need to eat some foods that are low in fat.

To find out the percent of calories from the fat for a food, use the Nutrition Facts Label.

Divide CALORIES FROM FAT by TOTAL CALORIES and multiply times 100.

\[
\frac{\text{Calories from Fat}}{\text{Total Calories}} \times 100 = \% \text{ of calories from fat}
\]

**Example:** A box of snack crackers provides 70 calories for a serving of 5 crackers. The “calories from fat” are listed as 20.

\[
\frac{20}{70} \times 100 = 28.6\% \text{ of calories from fat}
\]
Nutrient Search

Directions: Use the Nutrition Facts Labels from the cereal, snacks or packaged snacks from the cafeteria. List the names of the 4 foods in the first table and fill in the % Daily Value for fat, vitamin A, vitamin C, calcium and iron for one serving of the food. If the food item does not have one of the nutrients, put a zero in that column.

<table>
<thead>
<tr>
<th>Name of Food</th>
<th>Fat</th>
<th>Vitamin A</th>
<th>Vitamin C</th>
<th>Calcium</th>
<th>Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Complete the following charts using information from the chart above

<table>
<thead>
<tr>
<th>% Daily Value</th>
<th>For 3 servings</th>
<th>Fat</th>
<th>Vitamin A</th>
<th>Vitamin C</th>
<th>Calcium</th>
<th>Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Daily Value</th>
<th>For 4 servings</th>
<th>Fat</th>
<th>Vitamin A</th>
<th>Vitamin C</th>
<th>Calcium</th>
<th>Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Daily Value</th>
<th>For 6 servings</th>
<th>Fat</th>
<th>Vitamin A</th>
<th>Vitamin C</th>
<th>Calcium</th>
<th>Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Grade 4

Planning Healthy Meals and Snacks

Healthful Living Objective
4.04 Demonstrate the ability to plan healthy meals and snacks that emphasize the principals of MyPyramid.

Math Objectives
1.01 Compare and order rational numbers.
1.02 Develop fluency with multiplication and division and relationships between operations.
4.02 Describe the distribution of data using median and range.
4.03 Solve problems by comparing two sets of related data.

English Language Arts Objective
4.02 Use oral and written language to:
   • present information and ideas in a clear, concise manner
   • discuss
   • interview
   • solve problems
   • make decisions

Teacher Resources
• MyPyramid for Kids
• What Foods are in the Fruit Group?
• What Foods are in the Vegetable Group?

Handouts
• Fruits and Vegetables Grown in North Carolina – made into an overhead transparency
• Sweet Potato Math Puzzle
• My Fruit and Veggie Goals
• Price of Food Choices
• Food Choice Change
• Vegetable Orders
• Vegetable Orders Receipts

Focus
Display a transparency of the Fruits and Vegetables Grown in North Carolina teacher resource. Do not let the students see the title of the list of foods. Ask students how the foods are similar. Tell the students they are all grown in North Carolina. Ask students if they know what the state vegetable is for North Carolina (sweet potato). Ask students if they know that sweet potatoes are an excellent source of vitamin A. Distribute and direct students to complete the Sweet Potato Math Puzzle handout.

Teachers Input
Using the MyPyramid for Kids, What Foods are in the Fruit Group? and What Foods are in the Vegetable Group? teacher resources, review where fruits and vegetables fit into MyPyramid. Discuss the health benefits and the recommended number of servings of fruits and vegetables.

Ask students what kinds of fruits and vegetables they eat for meals and snacks at home and school. Brainstorm ways they could include more fruits and vegetables into meals and snacks. Refer to the What Foods are in the Fruit Group? and What Foods are in the Vegetable Group? teacher resources for suggestions.
Practice and Assessment
Distribute and direct students to complete the My Fruit and Veggie Goals handout. Ask each student to share orally with the class his/her fruit or vegetable goal.

Distribute and instruct students to complete the Price of Food Choices and Food Choice Change handouts. Discuss rank order, median and range. Ask students to determine the median and range of the numbers.

Distribute and direct students to work in pairs to complete the Vegetable Orders handout.

When the students have completed the Vegetable Orders handout, distribute and instruct them to work individually on the Vegetable Orders Receipts handout.
<table>
<thead>
<tr>
<th>Fruits and Vegetables Grown in North Carolina</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
</tr>
<tr>
<td>Green Beans</td>
</tr>
<tr>
<td>Cabbage</td>
</tr>
<tr>
<td>Cantaloupes</td>
</tr>
<tr>
<td>Grapes</td>
</tr>
<tr>
<td>Okra</td>
</tr>
<tr>
<td>Peppers</td>
</tr>
<tr>
<td>Pumpkins</td>
</tr>
<tr>
<td>Blueberries</td>
</tr>
<tr>
<td>Corn</td>
</tr>
<tr>
<td>Cucumbers</td>
</tr>
<tr>
<td>Potatoes</td>
</tr>
<tr>
<td>Soybeans</td>
</tr>
<tr>
<td>Sweet potatoes</td>
</tr>
<tr>
<td>Strawberries</td>
</tr>
<tr>
<td>Leafy Greens</td>
</tr>
<tr>
<td>Squash</td>
</tr>
<tr>
<td>Tomatoes</td>
</tr>
<tr>
<td>Watermelon</td>
</tr>
<tr>
<td>Peaches</td>
</tr>
</tbody>
</table>

Source: NC Department of Agriculture
Sweet Potato Math Puzzle

Sweet potatoes are cancer fighters, delivering a knockout punch of vitamin A (beta carotene).

Find out how many cups of broccoli it would take to equal the amount of vitamin A in just one sweet potato...Do the following math problems and be sure to write your answers down as you go.

Start with the number of pounds in a ton

Divide that by the number of years in a century

Multiply that number by the number of fingers on one hand (including thumb)

Now subtract from that number the number that is 9/10th of the lowest positive three-digit number

Finally, add to that the number that is "bad luck" especially on Fridays!

That is the magic number... that is the number of cups of broccoli that it would take to equal the vitamin A in just one sweet potato.
Sweet Potato Math Puzzle

Sweet potatoes are cancer fighters, delivering a knockout punch of vitamin A (beta Ccarotene).

Find out how many cups of broccoli it would take to equal the amount of vitamin A in just one sweet potato...Do the following math problems and be sure to write your answers down as you go.

Start with the number of pounds in a ton __2000__

Divide that by the number of years in a century ___20___

Multiply that number by the number of fingers on one hand (including thumb) ___100___

Now subtract from that number the number that is 9/10th of the lowest positive three-digit number ___10___

Finally, add to that the number that is "bad luck" especially on Fridays! ___23___

That is the magic number... that is the number of cups of broccoli that it would take to equal the vitamin A in just one sweet potato.
My Fruit and Veggie Goals

1. Circle the names of the fruits you have eaten.

Apple
Kiwifruit
Pineapple
Blackberry
Watermelon
Banana
Cantaloupe
Blueberry
Pear
Mango
Grape
Plum
Raspberry
Cranberry
Cherry
Orange
Peach
Strawberry
Grapefruit
Nectarine
Lime
Lemon
Guava
Papaya
Honeydew Melon

2. Write the names of fruits you would like to try.


3. How will you eat these fruits?


4. Describe a healthy snack that would include one of these fruits.
5. Circle the names of vegetables you have eaten.

<table>
<thead>
<tr>
<th>Corn</th>
<th>Celery</th>
<th>Carrot</th>
<th>Lettuce</th>
<th>Cucumber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peas</td>
<td>Potato</td>
<td>Squash</td>
<td>Zucchini</td>
<td>Green Onion</td>
</tr>
<tr>
<td>Onion</td>
<td>Radish</td>
<td>Rutabaga</td>
<td>Turnip</td>
<td>Beet</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>Asparagus</td>
<td>Green Pepper</td>
<td>Green Beans</td>
<td>Artichoke</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Cauliflower</td>
<td>Broccoli</td>
<td>Mushroom</td>
<td>Collard Greens</td>
</tr>
</tbody>
</table>

6. Write the names of vegetables you would like to try.

7. How will you eat these vegetables?

8. Describe a healthy meal that would include one of these vegetables.
### Price of Food Choices

**Directions:** Calculate the total cost of the food in each box. Show your work! Number the small boxes in order from lowest to highest cost.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 pounds of apples at 69 cents per pound</td>
<td></td>
</tr>
<tr>
<td>4 pounds of cherries at $.99 per pound</td>
<td></td>
</tr>
<tr>
<td>2 pounds of grapes at $1.29 per pound</td>
<td></td>
</tr>
<tr>
<td>5 pounds of peaches at 69 cents per pound</td>
<td></td>
</tr>
<tr>
<td>5 pounds of peas at 49 cents per pound</td>
<td></td>
</tr>
<tr>
<td>2 quarts of strawberries at $1.69 a quart</td>
<td></td>
</tr>
<tr>
<td>2 watermelons at $2.99 each</td>
<td></td>
</tr>
<tr>
<td>5 pounds of tomatoes at 79 cents per pound</td>
<td></td>
</tr>
<tr>
<td>3 pounds of blueberries at $1.00 per pound</td>
<td></td>
</tr>
<tr>
<td>4 heads of lettuce at 89 cents a head</td>
<td></td>
</tr>
</tbody>
</table>
**Price of Food Choices**

**Directions:** Calculate the total cost of the food in each box. Show your work! Number the boxes in order from lowest to highest cost.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Calculation</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 pounds of peas at 49 cents per pound</td>
<td>$6 \times .49 = $2.94</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2 watermelons at $2.99 each</td>
<td>$2 \times 2.99 = $5.98</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3 pounds of blueberries at $1.00 per pound</td>
<td>$3 \times 1.00 = $3.00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2 quarts of strawberries at $1.69 a quart</td>
<td>$2 \times 1.69 = $3.38</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5 pounds of peaches at 69 cents per pound</td>
<td>$5 \times .69 = $3.45</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>4 heads of lettuce at 89 cents a head</td>
<td>$4 \times .89 = $3.56</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4 pounds of cherries at $.99 per pound</td>
<td>$4 \times .99 = $3.96</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>6 pounds of apples at 69 cents per pound</td>
<td>$6 \times .69 = $4.14</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Food Choice Change

Directions: Jason has 2 twenty-dollar bills. Does he have enough to buy all of the items in the boxes? If so, how much change will he get back from the 2 twenty-dollar bills? Show your work! Draw three different combinations of change that he could get back.
Food Choice Change

**Directions:** Jason has 2 twenty-dollar bills. Does he have enough to buy all of the items in the boxes? If so, how much change will he get back from the 2 twenty-dollar bills? Show your work! Draw three different combinations of change that he could get back.

<table>
<thead>
<tr>
<th>$4.14</th>
<th>$20.00</th>
<th>$40.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3.96</td>
<td>$20.00</td>
<td>-$36.94</td>
</tr>
<tr>
<td>$2.58</td>
<td>$40.00</td>
<td>$3.06</td>
</tr>
<tr>
<td>$3.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$2.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$3.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$5.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$3.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$3.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$36.94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Change possibilities may vary but should equal $3.06
**Vegetable Orders**

**Directions:** Jane, Michael, Beverly and Joseph went to a restaurant. Each person had two vegetables as a part of the meal. Read the clues to match the person with his or her vegetable choices. Each vegetable can be chosen by only one person! If a choice can be removed by reading the clues, write NO in the space on the chart. Write YES in the correct place on the chart to identify the two vegetables chosen by each person.

<table>
<thead>
<tr>
<th></th>
<th>Green Beans</th>
<th>Cabbage</th>
<th>Potato</th>
<th>Broccoli</th>
<th>Greens</th>
<th>Carrots</th>
<th>Corn</th>
<th>Celery Sticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane</td>
<td>$.49</td>
<td>.49</td>
<td>.99</td>
<td>.85</td>
<td>.75</td>
<td>.59</td>
<td>.75</td>
<td>.30</td>
</tr>
<tr>
<td>Beverly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michael</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joseph</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Michael chose one vegetable that cost $.75
- Each of Jane’s vegetables cost less than $.75
- Beverly did not choose a vegetable that cost $.49
- Jane did not choose cabbage
- Michael’s friend chose celery sticks
- Jane did not order a vegetable that cost $.75
- One of Michael’s vegetables was a green vegetable
- Joseph sat next to his friend who chose green beans
- Beverly did not order the most expensive vegetable on the menu
- One of Beverly’s vegetables cost more than corn
- Michael sat next to his friend who ordered cabbage
- Joseph did not choose a vegetable that cost more than $.50
- Michael sat next to his friend who chose green beans
- Beverly’s total cost for her two vegetables was $1.60
- Beverly’s friend chose celery sticks
- Jane did not choose a vegetable that cost more that $.85
- Joseph chose two green vegetables
- One of Beverly’s choices was not greens
- Beverly chose one green vegetable and one yellow vegetable
- Beverly did not choose a vegetable that cost $.59
- Joseph’s total cost for the two vegetables was less than $1.00
- Michael sat next to his friend who ordered corn
- One of Jane’s vegetables choices was not the least expensive choice on the menu
- One of Jane’s vegetable choices cost less than corn but more than cabbage
- Michael bought one vegetable that cost more than broccoli
Vegetable Orders

Directions: Jane, Michael, Beverly and Joseph went to a restaurant. Each person had two vegetables as a part of their meal. Read the clues to match the person with their vegetable choices. Each vegetable can be chosen by only one person! If a choice can be removed by reading the clues, write NO in the space on the chart. Write YES in the correct place on the chart to identify the two vegetables chosen by each person.

<table>
<thead>
<tr>
<th></th>
<th>Green Beans</th>
<th>Cabbage</th>
<th>Potato</th>
<th>Broccoli</th>
<th>Greens</th>
<th>Carrots</th>
<th>Corn</th>
<th>Celery Sticks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Beverly</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Michael</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Joseph</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

- Michael chose one vegetable that cost $.75
- Each of Jane’s vegetables cost less than $.75
- Beverly did not choose a vegetable that cost $.49
- Jane did not choose cabbage
- Michael’s friend chose celery sticks
- Jane did not order a vegetable that cost $.75
- One of Michael’s vegetables was a green vegetable
- Joseph sat next to his friend who chose green beans
- Beverly did not order the most expensive vegetable on the menu
- One of Beverly’s vegetables cost more than corn
- Michael sat next to his friend who ordered cabbage
- Joseph did not choose a vegetable that cost more than $.50
- Michael sat next to his friend who chose green beans
- Beverly’s total cost for her two vegetables was $1.60
- Beverly’s friend chose celery sticks
- Jane did not choose a vegetable that cost more that $.85
- Joseph chose two green vegetables
- One of Beverly’s choices was not greens
- Beverly chose one green vegetable and one yellow vegetable
- Beverly did not choose a vegetable that cost $.59
- Joseph’s total cost for the two vegetables was less than $1.00
- Michael sat next to his friend who ordered corn
- One of Jane’s vegetables choices was not the least expensive choice on the menu
- One of Jane’s vegetable choices cost less than corn but more than cabbage
- Michael bought one vegetable that cost more than broccoli
**Vegetable Orders Receipts**

**Directions:** Jane, Beverly, Michael and Joseph have paid for their two vegetables and need a receipt for the amount paid. Each person gave $2.00 to the clerk and will receive change back. Complete the receipts by listing the two vegetables that each person chose, the cost of each vegetable, the total cost for the two vegetables, and the change received back. Number each receipt from the least to the greatest cost by placing a number from 1 to 4 in the circle at the top of the receipt.

Who paid the most for their vegetables? _________________________
Who paid the least for their vegetables? _________________________

<table>
<thead>
<tr>
<th>Jane's Receipt</th>
<th>Beverly's Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Receipt" /></td>
<td><img src="image2" alt="Receipt" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Michael's Receipt</th>
<th>Joseph's Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Receipt" /></td>
<td><img src="image4" alt="Receipt" /></td>
</tr>
</tbody>
</table>
**Vegetable Orders Receipts**

**Directions:** Jane, Beverly, Michael and Joseph have paid for their two vegetables and need a receipt for the amount paid. Each person gave $2.00 to the clerk and will receive change back. Complete the receipts by listing the two vegetables that each person chose, the cost of each vegetable, the total cost for the two vegetables, and the change received back. Number each receipt from the least to the greatest cost by placing a number from 1 to 4 in the circle at the top of the receipt.

Who paid the most for their vegetables? **Michael**

Who paid the least for their vegetables? **Joseph**

<table>
<thead>
<tr>
<th>Jane’s Receipt</th>
<th>Beverly’s Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2</strong></td>
<td><strong>3</strong></td>
</tr>
<tr>
<td>Receipt</td>
<td>Receipt</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Vegetable</td>
</tr>
<tr>
<td>Green Beans</td>
<td>Broccoli</td>
</tr>
<tr>
<td>Carrots</td>
<td>Corn</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>Cost</td>
</tr>
<tr>
<td>$.49</td>
<td>$.85</td>
</tr>
<tr>
<td>$.59</td>
<td>$.75</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Total</td>
</tr>
<tr>
<td>$1.08</td>
<td>$1.60</td>
</tr>
<tr>
<td>Cash received</td>
<td>Cash received</td>
</tr>
<tr>
<td>$2.00</td>
<td>$2.00</td>
</tr>
<tr>
<td>Change</td>
<td>Change</td>
</tr>
<tr>
<td>$.92</td>
<td>$.40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Michael’s Receipt</th>
<th>Joseph’s Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4</strong></td>
<td><strong>1</strong></td>
</tr>
<tr>
<td>Receipt</td>
<td>Receipt</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Vegetable</td>
</tr>
<tr>
<td>Potato</td>
<td>Cabbage</td>
</tr>
<tr>
<td>Greens</td>
<td>Celery sticks</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>Cost</td>
</tr>
<tr>
<td>$.99</td>
<td>$.49</td>
</tr>
<tr>
<td>$.75</td>
<td>$.30</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Total</td>
</tr>
<tr>
<td>$1.74</td>
<td>$ .79</td>
</tr>
<tr>
<td>Cash received</td>
<td>Cash received</td>
</tr>
<tr>
<td>$2.00</td>
<td>$2.00</td>
</tr>
<tr>
<td>Change</td>
<td>Change</td>
</tr>
<tr>
<td>$.26</td>
<td>$1.21</td>
</tr>
</tbody>
</table>

Revised from Smart Nutrition  Arkansas Department of Public Instruction
Healthful Living Objective
4.05 Summarize the concept and benefits of eating in moderation.

Math Objectives
1.02 Develop fluency with multiplication and division.
1.03 Solve problems using models, diagrams, and reasoning about fractions and relationships among fractions involving halves, fourths, eighths, thirds, sixths, twelfths, fifths, tenths, hundredths, and mixed numbers.
2.01 Develop strategies to determine the area of rectangles and the perimeter of plane figures.
2.02 Solve problems involving perimeters of plane figures and areas of rectangles.
4.03 Solve problems by comparing two sets of related data.

Teacher Resource
- Trends in Portion Sizes

Materials Needed
- Construction paper: yellow, brown, red and green
- Rulers
- Compasses
- Scissors
- Pencils
- Paper clips

Handouts
- Portion Sizes are Bigger
- Changing your Plate
- MyPyramid for Kids
- Let’s Make a Hamburger
- Hamburger Questions

Focus
Distribute the Portion Sizes are Bigger handout. Instruct students to look at the top row of serving sizes for pop (soda), popcorn, french fries and a hamburger. Ask students what they think the average portion size is today. After some discussion give them the correct answers and have them fill in the amount for the portion sizes for today. Instruct students to predict what the portion sizes would be in 50 years (2050) if portion sizes increased at the same rate.

Teacher Input
Using the Trends in Portion Sizes teacher resource, review the concepts of “servings” and “portions”. Brainstorm the trends in larger portions by using the following questions:
- Why do you think portions are getting bigger?
- What happens when we eat such large portions?
Discuss moderation:
- Moderation means eating a medium amount - not too much, not too little.
- Moderation means not getting carried away trying to do the right thing. For example, fiber is good, but that doesn’t mean eating 10 oat bran muffins a day is a good idea.
- Moderation means not getting stuck on just a few foods.
- Moderation should be used when eating foods with sugar, salt and fat.

Hamburgers are one of those foods that are getting bigger, but that does not mean that we should not eat them. It is okay to eat them in moderation. They are in the Meat and Beans Group and are a good source of protein and iron. MyPyramid recommends that we should eat about 4 to 5 ounces from the Meat and Beans Group each day. When the portion sizes are so big, for example a 6- to 8-ounce hamburger, it is easy to eat too much.

One way to think about what you are eating is how much space each food takes up on your plate. About half of your plate should be fruits and vegetables. One quarter of your plate should be grains. Only one quarter of your plate should be from the Meat and Beans Group.

**Practice and Assessment**
Distribute and instruct students to complete the *Change your Plate* handout. The *MyPyramid for Kids* handout can be used to help plan a meal.

Distribute and direct students to complete the *Let’s Make a Hamburger* and *Hamburger Questions* handouts.
### Portion Sizes are Bigger!

<table>
<thead>
<tr>
<th>Date</th>
<th>Pop (Soda)</th>
<th>Movie Theater Popcorn</th>
<th>Fast Food French Fries</th>
<th>Fast Food Hamburger</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>12 ounces</td>
<td>3 cups</td>
<td>27 fries</td>
<td>1.6 ounces</td>
</tr>
<tr>
<td>Today</td>
<td>_____ ounces</td>
<td>_____ cups</td>
<td>_____ fries</td>
<td>_____ ounces</td>
</tr>
<tr>
<td>2050</td>
<td>_____ ounces</td>
<td>_____ cups</td>
<td>_____ fries</td>
<td>_____ ounces</td>
</tr>
</tbody>
</table>
## Portion Sizes are Bigger!

<table>
<thead>
<tr>
<th>Date</th>
<th>Pop (Soda)</th>
<th>Movie Theater Popcorn</th>
<th>Fast Food French Fries</th>
<th>Fast Food Hamburger</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>12 ounces</td>
<td>3 cups</td>
<td>27 fries</td>
<td>1.6 ounces</td>
</tr>
<tr>
<td>Today</td>
<td>48 ounces</td>
<td>16 cups</td>
<td>96 fries</td>
<td>6 ounces</td>
</tr>
<tr>
<td>2050</td>
<td>172 ounces</td>
<td>85 cups</td>
<td>341 fries</td>
<td>22.5 ounces</td>
</tr>
</tbody>
</table>
Changing your Plate

Answer the questions for the plate below.

1. What fraction of the plate is from the Grain Group?

2. What fraction of the plate is from the Fruit Group?

3. What fraction of the plate is from the Meat and Beans Group?

4. What fraction of the plate is from the Vegetable Group?

5. Draw a new plate so that ½ is fruits and vegetables, ¼ is grains and ¼ is meat or beans. Write the foods you would include on your plate to make a healthy meal.

6. Why is it important to have a variety of foods on your plate?
Let’s Make a Hamburger

Materials:

Yellow, brown, red and green construction paper, rulers, compass, scissors, pencils, paper clips

Directions: Using the materials listed above construct a hamburger by following the 8 steps.

1. There must be one slice of cheese. The slice of cheese is yellow and is rectangular in shape with one side being 4 inches long and another side being 5 inches long. Write the word “cheese” on the slice.

2. Find the perimeter of the slice of cheese and write it under the word cheese.

3. There must be a brown hamburger bun. The bun has two identical parts. Each part of the bun is in the shape of a circle. The diameter of the circle is 5 inches. Write the word “bun” on each part.

4. There must be one beef patty inside the hamburger bun. The beef patty must be in a circle shape. It must be brown and have a radius of 2 inches. Write the word “beef patty” on the shape.

5. There must be one slice of red tomato on the hamburger. The tomato is round and has a diameter of 3½ inches. Write the word “tomato” on the slice.

6. One piece of green leaf lettuce should be on the hamburger. The leaf of lettuce should be four inches long and can be in any shape that resembles a leaf.

7. The hamburger must be put together with one part on top of the other. The order must be so that the tomato does not touch the cheese and the cheese does not touch the lettuce. One part of the hamburger bun must be on the top and one part of the bun must be on the bottom.

8. The hamburger is fastened together in proper order by a paper clip. On the top of the hamburger write the food groups represented in the hamburger.
Hamburger Questions

Directions: Solve the problems. Show your work!

1. In the HAPPY BURGERS restaurant one hamburger is made every five minutes. How many are made in an hour? How many hamburgers are made in a 12-hour day? How many will be made in a week (7 days) if HAPPY BURGERS is open for 12 hours a day?

2. If HAPPY BURGERS makes two hamburgers every six minutes. How many hamburgers will be made from 11:00 AM to 6:00 PM?

3. The total cost for a hamburger at HAPPY BURGERS is $1.34. If a customer buys two hamburgers, what will be the total cost? If the customer gives HAPPY BURGERS a five-dollar bill, how much change will the customer receive?

4. Name at least three combinations of change that could be received after purchasing the two hamburgers with a five-dollar bill.
Hamburger Questions

Directions: Solve the problems. Show your work!

1. In the HAPPY BURGERS restaurant one hamburger is made every five minutes. How many are made in an hour? How many hamburgers are made in a 12-hour day? How many will be made in a week (7 days) if HAPPY BURGERS is open for 12 hours a day?

   60 minutes in one hour divided by 5 minutes = 12 made in one hour
   12 per hour x 12 hours = 144 hamburgers in one day
   7 days x 144 = 1,008 hamburgers in a week

2. If HAPPY BURGERS makes two hamburgers every six minutes. How many hamburgers will be made from 11:00 AM to 6:00 PM?

   2 hamburgers in 6 minutes = 1 hamburger produced in 3 minutes
   60 minutes in one hour divided by 3 minutes = 20 hamburgers in one hour
   11:00 AM to 6:00 PM = 7 hours
   20 hamburgers in one hour x 7 hours = 140 hamburgers

3. The total cost for a hamburger at HAPPY BURGERS is $1.34. If a customer buys two hamburgers, what will be the total cost? If the customer gives HAPPY BURGERS a five-dollar bill, how much change will the customer receive?

   $1.34 x 2 = $2.68
   $5.00 -$2.68 = $2.32 in change

4. Name at least three combinations of change that could be received after purchasing the two hamburgers with a five-dollar bill.

   2 one-dollar bills  
   3 dimes  
   2 pennies

   9 quarters  
   1 nickel  
   2 pennies

   1 one-dollar bill  
   13 dimes  
   2 pennies
Grade 4

Water, Water Everywhere!

Healthful Living Objective
4.07 Evaluate the benefits of drinking plenty of water, especially before and after physical activity.

Math Objectives
1.02 Develop fluency with multiplication and division.
1.03 Develop fluency with addition and subtraction of non-negatives rational numbers with like denominators, including decimal fractions through hundredths.
4.02 Describe the distribution of data using median, range and mode.

English Language Arts Objective
3.05 Analyze and integrate information from one or more sources to expand understanding of text including graphs, charts and/or maps.

Teacher Resource
• Water

Materials Needed
• Gallon jug filled with water
• 2-quart milk carton filled with water
• 2-cup liquid measuring cup

Handouts
• Food Picture Cards – cut along dotted lines and laminate for long-term use
• Water Percent Cards – cut along dotted lines and laminate for long-term use
• Water Content of Foods
• Water Word Problems

Focus
Place a one gallon jug in the front of the room full of water. Direct students to stand. Tell students you are going to start counting and that when you reach the number of gallons of water that they think is in an average person’s body, they should sit down. Start to count. You will need to count up to 10. Our bodies contain at least 10-12 gallons of water or fluid.

Teachers Input
Using the Water teacher resource, discuss the functions of water in the body, sources of water and daily requirements and losses.

Show students the two-quart container and tell them this is the amount of liquid that an average adult will lose every day. Ask one student to pour out 12 ounces into a measuring cup. Tell them this is how much fluid you lose just from breathing. Most people need 8 to 12 cups of water daily from drinking water and other beverages.

Emphasize the importance of drinking plenty of water when being physically active to avoid dehydration (a loss of too much water from the body).
Talking Points:
- Drink plenty of fluids before, during and after activity. Carry a water bottle especially if you do not have a water source available.
- Drink fluids by schedule (every fifteen minutes) even when you do not feel thirsty.
- Wear light colored clothing.
- Be especially careful if you exercise in warm, humid weather.
- Signs of dehydration are flushed skin, fatigue, increased body temperature and increased breathing and pulse rate.

Practice and Assessment
Distribute the Food Picture Cards to half the students and the Water Percent Cards to the other half. Set up a silent matching relay. Instruct students with the Food Picture Cards to find students with the matching Water Percent Cards. Remind them of foods that are higher in water (soups, fruits, vegetables) and foods that are lower in water (bread, crackers, dried fruits).

After students have completed the matching game, distribute the Water Content of Foods handout. If the matches are not correct, instruct students to find the correct match. Using the Water Content of Foods handout, ask students the following:
- What is the range of the water content of foods?
- What is the median of the water content of foods?

Distribute and direct students to complete the Water Word Problems handout.
Grapes

Raw Oranges

Roast Beef

Roasted Chicken
Raisins

Cooked Rice

Chicken Noodle Soup

Cooked Oatmeal
<table>
<thead>
<tr>
<th>Percentage</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>93%</td>
<td>Water</td>
</tr>
<tr>
<td>91%</td>
<td>Water</td>
</tr>
<tr>
<td>89%</td>
<td>Water</td>
</tr>
<tr>
<td>87%</td>
<td>Water</td>
</tr>
<tr>
<td>60%</td>
<td>Water</td>
</tr>
<tr>
<td>6%</td>
<td>Water</td>
</tr>
<tr>
<td>4%</td>
<td>Water</td>
</tr>
<tr>
<td>57%</td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>85%</td>
<td>38%</td>
</tr>
<tr>
<td>Water</td>
<td>Water</td>
</tr>
<tr>
<td>81%</td>
<td>23%</td>
</tr>
<tr>
<td>Water</td>
<td>Water</td>
</tr>
<tr>
<td>70%</td>
<td>15%</td>
</tr>
<tr>
<td>Water</td>
<td>Water</td>
</tr>
<tr>
<td>68%</td>
<td>2(\frac{1}{2})%</td>
</tr>
<tr>
<td>Water</td>
<td>Water</td>
</tr>
</tbody>
</table>
The human body is approximately 70% water.

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Water Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken noodle soup</td>
<td>93%</td>
</tr>
<tr>
<td>Broccoli, raw</td>
<td>91%</td>
</tr>
<tr>
<td>Milk</td>
<td>89%</td>
</tr>
<tr>
<td>Orange, raw</td>
<td>87%</td>
</tr>
<tr>
<td>Cooked oatmeal</td>
<td>85%</td>
</tr>
<tr>
<td>Grapes</td>
<td>81%</td>
</tr>
<tr>
<td>Cooked rice</td>
<td>68%</td>
</tr>
<tr>
<td>Roasted chicken</td>
<td>60%</td>
</tr>
<tr>
<td>Roast beef</td>
<td>57%</td>
</tr>
<tr>
<td>Whole wheat bread</td>
<td>38%</td>
</tr>
<tr>
<td>Beef jerky</td>
<td>23%</td>
</tr>
<tr>
<td>Raisins</td>
<td>15%</td>
</tr>
<tr>
<td>Oatmeal cookie</td>
<td>6%</td>
</tr>
<tr>
<td>Saltine cracker</td>
<td>4%</td>
</tr>
<tr>
<td>Crispy rice cereal</td>
<td>2½%</td>
</tr>
</tbody>
</table>
Water Word Problems

1. Annie drank 8 ounces of water at breakfast, 4 ounces of juice at her snack, 8 ounces of milk for lunch, 8 ounces of water after she played outside, 8 ounces of milk at dinner and 6 ounces of juice before she went to bed. How many ounces of fluid did she get that day?

2. What was her total fluid intake in cups (1 cup = 8 ounces)?

3. What is the percentage of water in chicken soup?

4. What is the percentage of water in grapes?

5. What is the percentage of water in chicken?

6. What is the percentage of water in a cookie?

7. What is the sum of the percentages for the chicken soup, grapes, chicken and cookie?

8. What is the range of the percentages for the chicken soup, grapes, chicken and cookie?
Water Word Problems

1. Annie drank 8 ounces of water at breakfast, 4 ounces of juice at her snack, 8 ounces of milk for lunch, 8 ounces of water after she played outside, 8 ounces of milk at dinner and 6 ounces of juice before she went to bed. How many ounces of fluid did she get that day?

   **42 ounces**

2. What was her total fluid intake in cups (1 cup = 8 ounces)?

   **5.25 cup**

3. What is the percentage of water in chicken soup?

   **93%**

4. What is the percentage of water in grapes?

   **81%**

5. What is the percentage of water in chicken?

   **60%**

6. What is the percentage of water in a cookie?

   **6%**

7. What is the sum of the percentages for the chicken soup, grapes, chicken and cookie?

   **240%**

8. What is the range of the percentages for the chicken soup, grapes, chicken and cookie?

   **6-93%**
Grade 4

Tuning in to Good Nutrition

Healthful Living Objective
4.08 Provide examples of how the media and advertisers use persuasive techniques to influence food purchasing decisions.

English Language Arts Objectives
3.04 Make informed judgments about television and film/video productions.
3.05 Analyze and integrate information from one or more sources to expand understanding of text including graphs, charts and/or maps.

Teacher Resource
• Food Advertising Strategies

Materials Needed
• Magazine or newspaper food and beverage advertisements
• Videos or DVDs with several food and/or beverage commercials – NOTE: Saturday morning programming aimed at children would be a good time to record commercials
• TV, VCR or DVD player

Handouts
• Be a TV Food Ad Reviewer
• MyPyramid for Kids

Focus
Ask students to describe a food or drink advertisement they recently saw. Using the Food Advertising Strategies teacher resource, discuss advertising tricks of the trade.

Discussion questions:
• What is the purpose of food ads?
• What do companies include in their ads to sell their products?
• What are some ways ads try to catch your attention and sell the product?
• What does the ad seem to say that the product will do for you?
• Is it believable or do you believe it?
• How do the ads affect your thoughts about the product and whether you want to try it?
• Did the ad show people being physically active/getting some exercise?
• Would that be a good thing to show? Why?

Teacher Input
Distribute magazine or newspaper food and beverage advertisements to students. Discuss how companies also use packaging as another way to draw attention to the product and to attract consumers to it. Make a comparison of ads for a raw product and a corresponding processed/packaged one. Examples include apples/apple juice, potatoes/potato chips, corn/corn cereal. Compare the ad for apples (newspaper produce section) with the packaged product(s) that are made with apples.

Discussion Questions
• What is the same about each item?
• What is different?
• What do you like about each item?
• What do you dislike?
• Which one are you more likely to choose?
- How does the way the product looks or what's on the package help form your opinion?
- What are some other things you see on food packages that might make you want the product? Examples are premiums, such as when there's a prize inside the box or you can send for a product; being able to enter a sweepstakes or contest for a chance to win a prize; or being able to join a club of some type.

**Practice and Assessment**
Distribute the *Be a TV Food Ad Reviewer* handout and review briefly. Watch several recorded food and beverage commercials together and have students complete the handout for one of the commercials. Once they've completed the worksheet, ask them whether it changes the way they view food and drink ads and how they might react differently to ads in the future.

Distribute the *MyPyramid for Kids* handout. Discuss where the products viewed in the ads fit into the pyramid.
Be a TV Food Ad Reviewer

Companies that make foods and drinks often advertise on TV, hoping you’ll want to buy their product. To help you decide, it’s good to know how ads “talk” to you.

Review the commercials for foods and drinks in class. Write what you think about ONE ad.

1. What food or drink was featured in the ad?

2. What does the ad do to catch your attention and help sell the product (for example, does it use animation, music, bright colors or celebrities)?

3. What does the ad seem to say the product will do for you (for example, you’ll be stronger, smarter, have more fun if you eat/drink the product)?

4. Do you believe this? Why or why not?

5. Is the amount of food or drink shown in the ad too big to eat or drink at one time, too small or just right?

6. Does the ad show people doing active things like getting some exercise? If so, what are they doing?

7. After seeing the ad, do you want to try the food or drink? Why or why not?

8. Overall, I give this ad a (check one):
   - Thumbs Up
   - Thumbs Down
   Explain why:

Source: www.kidneric.com