



SCIENCE AND OUR FOOD SUPPLY

Using the **Nutrition Facts Label**
to Make Healthy Food Choices



Teacher's Guide for High School Classrooms
1st Edition





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Using the **Nutrition Facts Label** to Make Healthy Food Choices

Dear Teacher,

You may be familiar with *Science and Our Food Supply*, the award-winning supplemental curriculum developed by the U.S. Food and Drug Administration (FDA) and the National Science Teachers Association (NSTA). It uses food as the springboard to engage students in inquiry-based science and exploration, fostering awareness and proper behaviors related to food safety.

FDA has developed a new component to the program: *Science and Our Food Supply: Using the Nutrition Facts Label to Make Healthy Food Choices—Teacher's Guide for High School Classrooms, 1st edition*. Designed to be used separately or in conjunction with the original program, *Science and Our Food Supply: Using the Nutrition Facts Label* springs from current public awareness of the importance of instilling positive nutrition behaviors in youth for general lifelong health.

We are pleased to present you with this nutrition-based curriculum introducing students to the fundamentals of healthy food choices, using the **Nutrition Facts label** as the starting point. With engaging hands-on activities, students will become more aware of calories, serving size, and the nutrients they should get “more of” and “less of.” Designed for use by high school teachers, the emphasis is on an inquiry approach that is customizable to science, health, and/or family and consumer science classes, aligning with current education standards in these curriculum areas. It also supports educators seeking Science, Technology, Engineering, and Mathematics (STEM) activities for their classrooms.

The Science and Our Food Supply Team

FDA – an agency of the U.S. Government responsible for developing policy and regulations for nutrition labeling and food standards. FDA is also authorized by Congress to inspect, test, and set safety standards for all food, except meat, poultry, processed eggs, and catfish.

Curriculum Development Advisors – nutrition educators and teachers representing family and consumer science, health, biology, and related subject areas.

We are confident that your students will find *Science and Our Food Supply: Using the Nutrition Facts Label to Make Healthy Food Choices* to be an inspirational kickoff to learning about the science behind the nutrition choices they make every day, and set them on the path to healthy food and beverage decisions for a lifetime of good health!



www.fda.gov/teachsciencewithfood

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FDA offers a “Professional Development Program in Food Science,” designed to better prepare teachers in the use of *Science and Our Food Supply* to maximize the learning opportunities for their students. If you are interested in this program or other workshops and support opportunities, please visit the program’s website at www.teachfoodscience.org.

The web links provided in *Science and Our Food Supply: Using the Nutrition Facts label to Make Healthy Food Choices* were current at the time of publication. In the event that they change and/or are no longer available, we suggest that you visit the “home page” of the named organization. From there, search for topical information.

Permission is hereby granted in advance for the reproduction of these print materials in their entirety.

WELCOME TO SCIENCE AND OUR FOOD SUPPLY

Using the **Nutrition Facts Label** to Make Healthy Food Choices

You and your students are about to experience a program that incorporates nutrition as an important part of your existing curriculum.

When it comes to making science, consumer sciences, and health relevant for your students, what better way than to apply it to something that's part of their everyday lives? Food gives you an ideal springboard for introducing the science that is at the heart of nutrition and exploring the impact that daily food and beverage choices can have on overall health.

Science and Our Food Supply: Using the Nutrition Facts Label to Make Healthy Food Choices includes timely food science information to help you explore the impact of food choices on health.

You'll find in-depth information and activities covering these important topics:

- Calories and serving size: what they are and why they matter/the buzz behind a nutrient-dense daily diet
- An inside look at sugars
- Sodium and its impact on health
- Meal planning: adding up what's on your plate
- The variety of fats found in foods and beverages
- How to learn more about the food and beverages from restaurants and vending machines

NEWS FLASH!

We are currently in a Time of Two Labels.

FDA has updated the Nutrition Facts label with a fresh design, and companies still have time to begin using it. However, the new and improved Nutrition Facts label is already starting to appear on products nationwide.

Since we will see both label versions for a while, this Guide has information about each of them, what they have in common, and how they differ. Throughout this Guide, this icon will appear when the content is making a distinction about a difference between the original Nutrition Facts label and the new Nutrition Facts label.



WHY USING THE NUTRITION FACTS LABEL MATTERS

Good nutrition in childhood and adolescence sets the stage for better health. Nutrition plays a vital role throughout the lifespan. Today, too many children are consuming diets with too many calories and not enough nutrients, and are not getting enough physical activity.

FDA and the Nutrition Facts Label

Science and Our Food Supply: Using the Nutrition Facts Label to Make Healthy Food Choices incorporates key elements of FDA's public health education campaigns designed to help people understand nutrient information on food and beverage packages, and then use that information to make healthy dietary choices. The Centers for Disease Control and Prevention (CDC) stresses that schools play a particularly critical role by providing opportunities for students to learn about and practice healthy eating and physical activity behaviors. Making the Nutrition Facts label an integral part of daily behaviors today and in the future can "move the needle" in equipping youth for a lifetime of making healthy food choices.

High school is an ideal time to incorporate nutrition concepts as a part of your curriculum, using nutrition as a springboard to important science, family and consumer science, and health-related topics. Students at this age are in a transition phase, becoming more responsible for themselves and making many of their own food choices. Helping them to establish good habits as they are learning to make these decisions can have a tremendous long-term impact!

The **Nutrition Facts label** is an accessible tool with nutrient information to help make healthy food choices once you know how to use it properly. It can serve as a key contributor to healthy decision-making — and the earlier one starts using it, the better! Good nutrition not only aids in general well-being, but also can help prevent or manage chronic diseases later in life.

HIGHLIGHTS OF YOUR TEACHER'S GUIDE

What's Inside . . .

Background Information begins each module/activity with an introduction to key concepts and health context for that module.

Activities use the Nutrition Facts label and get students engaged with hands-on exploration.

Student Worksheets are reproducible handouts for students to record their nutrient data.

Resources list online references and materials supporting each activity. In addition to these resources, check out www.fda.gov/teachsciencewithfood for more online resources.

Connections to Curriculum Standards

During the production of this curriculum, developers and education reviewers recognized the need to connect this program to curriculum standards that provide the guidance for many state and local education frameworks regarding the content that should be taught at particular levels, and what students at each level should be able to do and to understand. See pages 66–68.

You should carefully examine local and state frameworks and curriculum guides to determine the best method of integrating *Science and Our Food Supply: Using the Nutrition Facts Label to Make Healthy Food Choices* into the program(s) of your school. Appropriate placement within the scope and sequence context of a school's curriculum will optimize the interdisciplinary connections and enhance the ability of a student to learn key concepts related to healthy eating.

Watch for the following icons . . .



Background Information

Indicates nutrition background information



Activity

Indicates an activity



Video

Show or review a video clip



A Time of Two Labels

OVERVIEW OF ACTIVITIES

The activities are written in this easy-to-understand format.

MODULE 2: NUTRIENTS TO GET LESS OF

SUGAR IN BEVERAGES

TIME One 45-Minute Class Period

ACTIVITY AT A GLANCE
In this activity, students will learn how to determine the amount of calories and sugar in different beverages. After completion of the activity, students will gain an appreciation of how many calories and how much sugar is in the beverages they are consuming. This will hopefully lead to an increase in students' awareness of how consumption of sugary beverages can impact overall diet and calorie needs. Note: This activity uses table sugar to represent all the different kinds of sugars in the beverages.

TIME TO TUNE IN
Play FDA's online video clip, designed to alert students about Nutrition Facts labels.
Your Food Is Telling You Something
www.fda.gov/food/foodpackaginglabeling/LabelingNutritionCom042013.html

PUBLIC HEALTH CONNECTION
Beverages contribute substantially to overall calorie intake for most people in the U.S. Although they provide needed water, many beverages add calories to the diet without providing important nutrients. They should be consumed in the context of total calorie intake and how they can fit into the eating pattern of each individual. In the U.S., people ages 2 and older consume an average of about 400 calories per day as beverages.
As the amount of solid fats and/or added sugars increases in the diet, it can be more difficult to also eat foods with sufficient dietary fiber and important vitamins and minerals, and eat less within calorie limits. Although the consumption of total fat and added sugars among children and adolescents has decreased in recent years, intakes continue to exceed recommended limits. Sugar-sweetened beverages are the largest source of calories from added sugars among children and adolescents. Added sugars account on average for almost 270 calories, or more than 13 percent of total calories per day in the U.S. population, making it a significant food category, especially for young children, adolescents, and young adults.
The Dietary Guidelines for Americans recommend that added sugars be limited to less than 10 percent of calories per day. This recommendation is a target that applies to all calorie levels to help maintain healthy eating patterns within calorie limits. In addition, eating patterns characterized by lower intake of sources of added sugars are associated with reduced risk of cardiovascular disease.

HIGH SCHOOL

TIME: The approximate amount of time needed to perform the activity.

ACTIVITY AT A GLANCE: Briefly summarizes the activity.

TIME TO TUNE IN: Shows the URL for an optional, online video related to that module.

PUBLIC HEALTH CONNECTION: Relates background information to public health impact.

MATERIALS: Includes the items needed to perform the activity.

ADVANCE PREPARATION: Indicates what you need to do before conducting the activity.

MODULE 3: NUTRIENTS TO GET MORE OF

MEAL PLANNING

GETTING STARTED

MATERIALS

- Meal Planning Handouts – Power of Choice Nutrition Facts Cards (online or printed, URL may change) www.fda.usda.gov/food/foodpackaginglabeling/NutritionLabels.pdf
- This link includes a Nutrition Facts label template. If you want to add other choices.
- FDA's Nutrition Information for Raw Fruits, Vegetables, and Seafood (online or printed) www.fda.gov/food/foodpackaginglabeling/LabelingNutritionCom061307.htm

ADVANCE PREPARATION

Before beginning the activity, decide how students will access the nutrition information for the foods they will use as they plan their meal. Students can access nutrition information either online (websites listed above) or as printed materials. Plan ahead so that students have access to computers to find the information, or print enough materials for your class for this lesson. Common breakfast foods are listed on the page in case you would like to use these along with the FDA fruit, vegetable, and seafood nutrition information charts available below for this activity.

Alternatively, you could bring clean, empty food containers for breakfast foods, such as yogurt, eggs, milk, and cereals, for your students to use.

Fruit, Vegetable, and Seafood Information

Nutrition facts for fruit, vegetable, and seafood choices are shown in the FDA handouts at www.fda.gov/food/foodpackaginglabeling/LabelingNutritionCom061307.htm

Common Breakfast Foods

Nutrition Facts labels for common breakfast items are available from the Power of Choice website at www.fda.gov/food/foodpackaginglabeling/NutritionLabels.pdf

- Bacon
- Eggs
- Butter, whole wheat
- Butter
- Cereal, corn flakes
- Cereal, oatmeal
- Cheddar, cheddar
- Donut/fruit, glazed
- Egg, hard cooked
- Fruit juice, orange with calcium
- Fruit juice, tomato
- Milk, 2% fat
- Margarine, tub
- Milk, 2% fat
- Muffin, plain
- Yogurt, plain, low fat
- Yogurt, low fat with fruit

HIGH SCHOOL

MODULE 2: NUTRIENTS TO GET LESS OF

SODIUM IN SNACK FOODS

INTRODUCTION

Virtually all Americans consume more sodium than they need. Sodium is primarily consumed as salt (sodium chloride).

Engage your students by either asking students the following questions or giving them copies of FDA's Fact Sheet: Sodium in Your Diet – Use the Nutrition Facts Label and Reduce Your Intake. Ask them what their favorite snacks are. Next, ask them:

- What is sodium?
- What important functions does sodium have in the body?
- What effect does sodium have on blood pressure?
- How much sodium do most people consume daily?
- Which foods contain the most sodium?

PROCEDURE

Use the handout for the suggested snacks on page 27, and have the students match the bags of salt with the image of the snack food and record their answers on their worksheets.

- Have students match the snack food images with the amount of sodium and record their answers on their worksheets.
- Divide foodstuffs, discuss which bag of sodium (salt) correctly matches each image.

REVIEW

Ask students:

- What is the recommended daily limit for sodium? (2,300 mg)
- Where does most of the sodium in our diet come from? (Over 70% of dietary sodium comes from processed and packaged foods.)
- What foods are highest in sodium, and what foods have less sodium? (Most of the sodium comes from the following foods: breads and rolls, pizza, sandwiches, cold cuts, and cured meats, soups, burrito and taco, salty snacks (chips, popcorn, pretzels, snack mixes, and crackers), chicken, cheese, and eggs and omelets. Fresh fruits and vegetables are examples of foods that are lower in sodium.)
- What are some ways to reduce sodium intake? (See next page.)

(See page 30 for an optional printable Student Review Worksheet)

HIGH SCHOOL

INTRODUCTION: Provides fun, innovative suggestions for introducing the activity. Where provided, suggested teacher dialogue is indicated by *boldface italics*.

PROCEDURE: Gives the step-by-step process for the activity. Where provided, suggested teacher dialogue is indicated by *boldface italics*.

REVIEW: Uses interesting questions to guide students through a review of what they learned in the activity. (Answers to questions are listed in parentheses.)

SUMMARY: Summarizes key concepts learned in the activity.

EXTENSIONS: Suggests activities to help students learn more about the topic.

RESOURCES: Provides references to online resources for the activity or for further study.

UP NEXT: Gives a preview of the next activity.

MODULE 1: INTRODUCING THE NUTRITION FACTS LABEL

SERVING SIZE & CALORIES

PROCEDURE

Students can work alone or in groups.

- Allow students to choose which cereal they want to pour into their bowls or select the cereal for them, whichever is preferred.
- If it might be useful to compare the product serving size to the student serving size, then the students should weigh their empty bowls first.
- Have students pour their servings into the paper or plastic bowls.
- Have students weigh each bowl with the serving on the gram scale to see the weight of the serving, or pour the cereal in the serving size plastic measuring cup to see the serving volume.
- If students use weight to compare, have them subtract the weight of their empty bowls.
- Ask students to write down the weight or volume of their cereal servings and compare it to what is shown on the Nutrition Facts label on that cereal box.

REVIEW

Ask students to raise their hands if their serving was smaller than the portion listed on the Nutrition Facts label on the box. Then ask if their serving size was about the same. Finally, ask if their serving size was larger.

Point out that if they were consuming fewer calories if their serving was smaller and more calories if it was larger. For example, twice the serving size would have twice the calories.

SUMMARY

Serving size, calories, and nutrients are all shown on the Nutrition Facts label.

EXTENSIONS

- Check out the serving size on any food containers, including snacks. One package may contain more than one serving. Knowing the number of servings per container lets you discover the total number of calories and nutrients per package.
- Read the label on your favorite snacks – and measure out single servings. Keep them in resealable plastic bags or containers to use one grab-and-go!
- Have students look for the new Nutrition Facts label in stores and bring in old and new labels to compare and discuss. If students do not want to purchase the items they find, they can take photos of the labels and then discuss.

RESOURCES

- Nutrition Facts Label: Read the Label! Youth Edition (page 2) www.fda.gov/food/foodpackaginglabeling/LabelingNutritionCom021714c.htm
- FDA's Interactive Label www.fda.gov/food/foodpackaginglabeling/LabelingNutritionCom042013.html
- MyPlate website www.choosemyplate.gov
- Physical Activity Guidelines for Americans <https://health.gov/dietaryguidelines/2015/guidelines/appendix-1>
- Food Serving Sizes Get a Healthy Check www.fda.gov/food/foodpackaginglabeling/LabelingNutritionCom13062013.htm

UP NEXT

Note that this lesson more about serving size, let's take a look at some techniques to get us off to a good start.

HIGH SCHOOL

MODULE 1 INTRODUCING THE NUTRITION FACTS LABEL



This module introduces what nutrients are and how they are shown on the Nutrition Facts label.

BACKGROUND INFORMATION



This section introduces Nutrients, Calories, and the concept of Nutrient-Dense Foods. It also highlights the information that is found on the Nutrition Facts label.

ACTIVITY



Serving Size and Calories introduces the concept of comparing Serving Size on the Nutrition Facts label to actual servings that are being consumed.



Time to Tune In

The online video clip introduces the information found on the **Nutrition Facts label**.

The Nutrition Facts Label: Look for It and Use It.
www.fda.gov/Food/LabelingNutrition/ucm426680.htm



Original vs. New Nutrition Facts Label - Standard Format

	Original Label	New Label
Required Nutrients	<ul style="list-style-type: none"> calories calories from fat total fat saturated Fat trans fat cholesterol sodium total carbohydrate dietary fiber sugars protein vitamin A vitamin C calcium iron 	<ul style="list-style-type: none"> calories total fat saturated fat trans fat cholesterol sodium total carbohydrate dietary fiber total sugars added sugars protein vitamin D calcium iron potassium
Optional Nutrients	<ul style="list-style-type: none"> monounsaturated fat polyunsaturated fat soluble fiber insoluble fiber sugar alcohol other carbohydrate vitamins (such as biotin, folate, niacin, riboflavin, pantothenic acid, thiamin, vitamin B6, vitamin B12, vitamin D, vitamin E, and vitamin K) minerals (such as chromium, copper, iodine, magnesium, manganese, molybdenum, phosphorus, potassium, selenium, and zinc) 	<ul style="list-style-type: none"> monounsaturated fat polyunsaturated fat soluble fiber insoluble fiber sugar alcohol vitamins (such as biotin, folate, niacin, riboflavin, pantothenic acid, thiamin, vitamin B6, vitamin B12, vitamin A, vitamin C, vitamin E, and vitamin K) minerals (such as chromium, copper, fluoride, iodine, magnesium, manganese, molybdenum, phosphorus, selenium, and zinc)



BACKGROUND INFORMATION

What is a Nutrient?

- A nutrient is a substance in food that contributes to growth and health. Nutrients provide energy, cell-building and structural materials, and agents that regulate body chemistry.
- Nutrients include proteins, fats, carbohydrates, vitamins, minerals, and water. Examples of nutrients that are important for growing bodies are protein and calcium.

What are Calories?

- Calories give your body energy to survive and thrive. Calories refer to the “energy” supplied from all food sources (fat, carbohydrate, and protein).
- 2,000 calories a day is used for general nutritional advice, but calorie needs vary. In fact, your calorie needs may be higher or lower and will depend on your age, gender, height, weight, and physical activity level.
- Calories with little or no beneficial nutrients are sometimes referred to as “empty calories.” Most empty calories come from added solid fats, added sugars, and refined starches.

Nutrient-Dense Foods

To get the nutrients you need within the right amount of calories, it’s best to choose “Nutrient-Dense” foods.

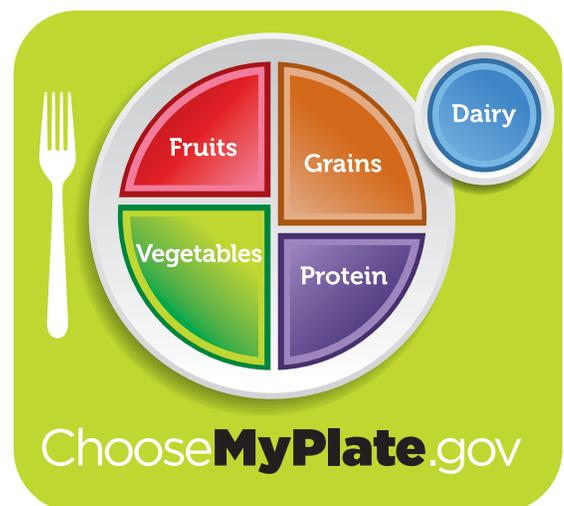
- Unlike foods with “empty calories,” nutrient-dense foods and beverages contain vitamins, minerals, dietary fiber, and other substances that may have positive health effects, while contributing relatively few calories.
- Fruits, vegetables, whole grains, seafood, eggs, beans and peas, unsalted nuts and seeds, fat-free and low-fat milk and milk products, and lean meats and poultry are examples of nutrient-dense foods.



DID YOU KNOW?

A healthy diet includes protein, carbohydrates, and fats.

- 1 gram of protein has 4 calories
- 1 gram of carbohydrates has 4 calories
- 1 gram of fat has 9 calories.



Visit www.choosemyplate.gov to determine your personal daily calorie needs.

BACKGROUND INFORMATION



Nutrition Primer: What's on the Label?

Serving Size

Serving Size is based on the amount of food that is customarily eaten at one time. All of the nutrition information listed on a food's Nutrition Facts label is based on one serving of that food, except as otherwise indicated on a dual column label.

The serving size is shown as a common household measure that is appropriate to the food (such as cup, tablespoon, piece, slice, or jar), followed by the metric amount in grams (g).

When you compare calories and nutrients between different foods, don't forget to check the serving size in order to make an accurate comparison.

Servings Per Container

Servings Per Container shows the total number of servings in the entire food package or container. Often, one package of food may contain more than one serving!

The information listed on the Nutrition Facts label is based on **one** serving. So, if a package contains **two servings** and you eat the entire package, you have consumed **twice** the amount of *calories* and *nutrients* listed on the label.

DID YOU KNOW?

The serving sizes listed on the Nutrition Facts label are not recommended serving sizes. By law, serving sizes must be based on how much food people actually consume, and not on what they should eat.

With the new Nutrition Facts label, serving sizes have been updated to reflect what people actually eat and drink today. In some cases, the new serving sizes are smaller. For example, today's individually packaged yogurts more often come in 6-ounce containers, versus the previous 8-ounce ones. For other products, the serving size is now larger. For example, the serving size for ice cream was previously 1/2 cup and now is 2/3 cup.

Calories

Calories refers to the total number of calories or "energy" supplied from all sources (fat, carbohydrate, and protein) in one serving of the food.

Calories from Fat

These are not additional calories; rather, they are the calories in each serving that come from fat.

Remember that fat-free doesn't mean calorie-free. Lower fat items may have as many calories as full-fat versions due to their sugar content.

"Calories from Fat" was removed from the new Nutrition Facts label.

Nutrients

The Nutrition Facts label can help you learn about the nutrient content of many foods in your diet. It also enables you to compare foods to make healthy choices.

Percent Daily Value (%DV)

The **Percent Daily Value (%DV)** tells you how much of a nutrient is in one serving of that food. The %DVs are based on the Daily Values which are the amounts of key nutrients generally recommended (to either consume or not exceed) per day for people 4 years of age and older.

You can use the %DV to compare food products and to choose products that are higher in nutrients you want to get more of (like dietary fiber and calcium) and lower in nutrients you want to get less of (like saturated fat and sodium). The %DV column doesn't add up vertically to 100%; instead, the % Daily Value represents the percentage of the Daily Value for each nutrient in one serving of the food. As a general rule:

- **5% DV** or less of a nutrient per serving is **low**.
- **20% DV** or more of a nutrient per serving is **high**.



Note: For the new Nutrition Facts label, the daily values for some nutrients have been updated based on new scientific evidence.

Nutrients to get less of (get less than 100% DV each day):

- saturated fat
- *trans* fat
- sodium
- added sugars

(Note: *trans* fat has no %DV, so use the grams to compare)

Nutrients to get more of (get 100% DV on most days):

- dietary fiber
- vitamin A
- vitamin C
- vitamin D
- calcium
- potassium
- iron

The * [asterisk] at the bottom of the label is a reminder that the %DVs are based on a 2,000 calorie diet. You may need more or fewer calories, but the %DV is still a helpful gauge.

Ingredient List

The **Ingredient List** shows each ingredient in a food by its common or usual name in descending order by weight. The Ingredient List is usually located near the name of the food's manufacturer and often below the Nutrition Facts label.

Turn the page for
Nutrition Facts label handouts!

A TIME OF TWO LABELS

WHAT'S ON THE ORIGINAL LABEL?



Nutrition Facts

Serving Size 2/3 cup (55g)
Servings Per Container About 8

Amount Per Serving

Calories 230 Calories from Fat 72

	% Daily Value*
Total Fat 8g	12%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	12%
Dietary Fiber 4g	16%
Sugars 12g	
Protein 3g	
Vitamin A	10%
Vitamin C	8%
Calcium	20%
Iron	45%

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

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

A Note About Label Formats

Most packages use the general format of the Nutrition Facts label, as shown on pages 8 and 9 of this Guide. This is considered the **Standard** label.

Nutrition Facts labels on some small packages (e.g., nut bars) without enough space for a full label may use a **Linear** format. A food having insignificant amounts of most nutrients may use a **Simplified** format which only lists five "core" nutrients: calories, total fat, sodium, total carbohydrate, and protein.

Some packages will have a **Dual Column** label that shows calories and nutrients on both a "per serving" and "per package" basis to help people understand how much they consume.

Serving Size

Serving size is based on the amount of food that is customarily eaten at one time. All of the nutrition information on the label is based on one serving of that food.

Check to see if the serving size is the same when comparing calories and nutrients in different foods.

Servings Per Container

Servings Per Container shows the total number of servings in the entire food package or container. Often, one package of food may contain more than one serving!

The information listed on the Nutrition Facts label is based on **one** serving. So, if a package contains **two servings** and you eat the entire package, you have consumed **twice** the amount of *calories* and *nutrients* listed on the label.

Calories

Balance the number of calories you consume with the number of calories your body uses to achieve or maintain a healthy weight.

The amount of calories in each serving is listed on the left side.

When comparing foods, remember:

- 100 calories per serving is MODERATE
- 400 calories per serving is HIGH

Calories from Fat

These are not additional calories; rather, they are the calories in each serving that come from fat.

Remember that fat-free doesn't mean calorie-free. Lower fat items may have as many calories as full-fat versions due to their sugar content.

Nutrients To Get Less Of

Saturated fat, *trans* fat, sodium, and sugars are nutrients to get less of.

Aim for less than 100% DV of these nutrients each day (Note: *trans* fat and sugars have no %DV, so use grams to compare).

Nutrients To Get More Of

Americans often don't get enough dietary fiber, vitamin A, vitamin C, calcium, and iron in their diets.

Aim for 100% DV of these nutrients on most days.

Percent Daily Value (%DV)

The Percent Daily Value (% Daily Value) tells you how much of a nutrient is in one serving of a food. The %DVs are based on the Daily Values which are the amounts of key nutrients generally recommended per day for people 4 years of age and older.

When comparing nutrients in foods, remember:

- 5% Daily Value or less of a nutrient per serving is low
- 20% Daily Value or more of a nutrient per serving is high.

Footnote with Daily Values

The %DVs are based on a 2,000-calorie diet. However, your Daily Values may be higher or lower depending on your calorie needs, which vary according to age, gender, height, weight, and physical activity level.

Check your calorie needs at www.choosemyplate.gov

A TIME OF TWO LABELS

WHAT'S ON THE NEW LABEL?



Nutrition Facts	
1	8 servings per container Serving size 2/3 cup (55g)
2	Amount per serving Calories 230
	% Daily Value*
3	Total Fat 8g 10% Saturated Fat 1g 5% Trans Fat 0g
	Cholesterol 0mg 0% Sodium 160mg 7% Total Carbohydrate 37g 13% Dietary Fiber 4g 14% Total Sugars 12g
4	Includes 10g Added Sugars 20% Protein 3g
5	Vitamin D 2mcg 10% Calcium 200mg 15% Iron 8mg 45% Potassium 235mg 6%
6	* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Key Changes

The U.S. Food and Drug Administration has finalized a new Nutrition Facts label for packaged foods that will make it easier for you to make informed food choices that support a healthy diet. The updated label has a fresh new design and reflects current scientific information, including the link between diet and chronic diseases.

1. Servings

The number of “servings per container” and the “Serving size” declaration are now in larger and/or bolder type. Serving sizes have been updated to reflect what people actually eat and drink today. For example, the serving size for ice cream was previously 1/2 cup and now is 2/3 cup.

There are also new labeling requirements for certain size packages, such as those that are between one and two servings or are larger than a single serving but could be consumed in one or multiple sittings. Some larger products will require a “dual column” label that shows calories and nutrients on both a “per serving” and “per package” basis to show people the amounts they are getting.

2. Calories

“Calories” is now larger and bolder.

3. Fats

“Calories from Fat” has been removed because research shows the type of fat consumed is more important than the amount.

4. Added Sugars

“Added Sugars” includes sugars that are either added during the processing of foods, or are packaged as such (e.g., a bag of table sugar), and include sugars from syrups and honey, and sugars from concentrated fruit or vegetable juices.

5. Nutrients

The lists of nutrients that are required or permitted on the label have been updated. Vitamin D and potassium are now required on the label because Americans do not always get the recommended amounts. Vitamins A and C are no longer required since deficiencies of these vitamins are rare today. The actual amount (in milligrams or micrograms) in addition to the %DV must be listed for vitamin D, calcium, iron, and potassium on the standard label.

The daily values for nutrients have also been updated based on newer scientific evidence. The daily values are reference amounts of nutrients to consume or not to exceed and are used to calculate the %DV.

6. Footnote

The footnote at the bottom of the label has changed to better explain the meaning of %DV. The %DV helps you understand the nutrition information in the context of a total daily diet.

Remember: During this transition time, you will see the original Nutrition Facts label or the new label on products.

For more information about the new Nutrition Facts label, visit:
www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm385663.htm

DIETARY GUIDELINES FOR AMERICANS 2015 – 2020

The Guidelines

1. Follow a healthy eating pattern across the lifespan.

All food and beverage choices matter. Choose a healthy eating pattern at an appropriate calorie level to help achieve and maintain a healthy body weight, support nutrient adequacy, and reduce the risk of chronic disease.

2. Focus on variety, nutrient density, and amount.

To meet nutrient needs within calorie limits, choose a variety of nutrient-dense foods across and within all food groups in recommended amounts.

3. Limit calories from added sugars and saturated fats and reduce sodium intake.

Consume an eating pattern low in added sugars, saturated fats, and sodium.

Cut back on foods and beverages higher in these components to amounts that fit within healthy eating patterns.

4. Shift to healthier food and beverage choices.

Choose nutrient-dense foods and beverages across and within all food groups in place of less healthy choices. Consider cultural and personal preferences to make these shifts easier to accomplish and maintain.

5. Support healthy eating patterns for all.

Everyone has a role in helping to create and support healthy eating patterns in multiple settings nationwide, from home to school to work to communities.

Key Recommendations

The *Dietary Guidelines'* Key Recommendations for healthy eating patterns should be applied in their entirety, given the interconnected relationship that each dietary component can have with others.

Consume a healthy eating pattern that accounts for all foods and beverages within an appropriate calorie level.



A healthy eating pattern includes:

- A variety of vegetables from all of the subgroups—dark green, red and orange, legumes (beans and peas), starchy, and other
- Fruits, especially whole fruits
- Grains, at least half of which are whole grains
- Fat-free or low-fat dairy, including milk, yogurt, cheese, and/or fortified soy beverages
- A variety of protein foods, including seafood, lean meats and poultry, eggs, legumes (beans and peas), and nuts, seeds, and soy products
- Oils



A healthy eating pattern limits:

- Saturated fats and *trans* fats, added sugars, and sodium

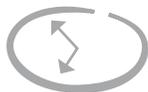
Key Recommendations that are quantitative are provided for several components of the diet that should be limited. These components are of particular public health concern in the United States, and the specified limits can help individuals achieve healthy eating patterns within calorie limits:

- Consume less than 10 percent of calories per day from added sugars.
- Consume less than 10 percent of calories per day from saturated fats.
- Consume less than 2,300 milligrams (mg) per day of sodium.
- If alcohol is consumed, it should be consumed in moderation—up to one drink per day for women and up to two drinks per day for men—and only by adults of legal drinking age.

In tandem with the recommendations above, Americans of all ages—children, adolescents, adults, and older adults—should meet the *Physical Activity Guidelines for Americans* to help promote health and reduce the risk of chronic disease. Americans should aim to achieve and maintain a healthy body weight. The relationship between diet and physical activity contributes to calorie balance and managing body weight. As such, the *Dietary Guidelines* includes a Key Recommendation to meet the *Physical Activity Guidelines for Americans*.



SERVING SIZE & CALORIES



TIME One 45-Minute Class Period



ACTIVITY AT A GLANCE

In this activity, students will measure out what they think is a serving size of breakfast cereal and compare it to the amount listed on the Nutrition Facts label to determine how their serving compares to what is on the label, and to compare the corresponding number of calories. After completion of the activity, students will better understand what is meant by “serving size” on the food label and gain an appreciation of how many calories each serving contains.



TIME TO TUNE IN

Nutrition Facts Label Online Video Clip

Show the *Read the Label Youth Outreach Campaign* short video to introduce the Nutrition Facts label.

The Nutrition Facts Label: Look for It and Use It.
www.fda.gov/Food/LabelingNutrition/ucm426680.htm

GETTING STARTED

MATERIALS

- Breakfast cereal in boxes/containers
- Paper or plastic bowls to hold cereal
- Gram scales and/or plastic measuring cups to measure and compare mass and/or volume

ADVANCE PREPARATION

Collect breakfast cereal in containers/boxes for the activity. There is a wide variety of choices on the market. Feel free to use as many or as few for this activity as you would like.

INTRODUCTION

Engage the students by asking them to raise their hands if they typically eat breakfast cereal. Ask them how many servings they think they consume at one meal. Tell the students that the class is going to see how their serving sizes compare to what’s on the Nutrition Facts label.



MODULE 1: INTRODUCING THE NUTRITION FACTS LABEL

SERVING SIZE & CALORIES

PROCEDURE

Students can work alone or in groups.

1. Allow students to choose which cereal they want to pour into their bowls or select the cereals for them, whichever is preferred.
2. If weight will be used to compare the product serving size to the student serving size, then the students should weigh their empty bowls first.
3. Have students pour their servings into the paper or plastic bowls.
4. Have students weigh each bowl with the serving on the gram scale to see the weight of the serving, or pour the cereal in the serving into a plastic measuring cup to see the serving volume.
5. If students use weight to compare, have them subtract the weight of their empty bowls.
6. Ask students to write down the weight or volume of their cereal servings and compare it to what is shown on the Nutrition Facts label on that cereal's box.

REVIEW

Ask students to raise their hands if their serving size was smaller than the portion listed on the Nutrition Facts label on the box. Then ask if their serving size was about the same. Finally, ask if their serving size was larger.

Point out that they were consuming fewer calories if their serving was smaller and more calories if theirs was larger. For example, twice the serving size would have twice the calories.

SUMMARY

Serving size, calories, and nutrients are all shown on the Nutrition Facts label.

EXTENSIONS

1. Check out the serving size on any food container, including snacks. One package may contain more than one serving! Knowing the number of servings per container lets you discover the total number of calories and nutrients per package.
2. Read the label on your favorite snacks — and measure out single servings. Keep them in resealable plastic bags or containers so you can grab-and-go!
3. Have students look for the new Nutrition Facts label in stores and bring in old and new labels to compare and discuss. If students do not want to purchase the items they find, they can take photos of the labels with their phones.

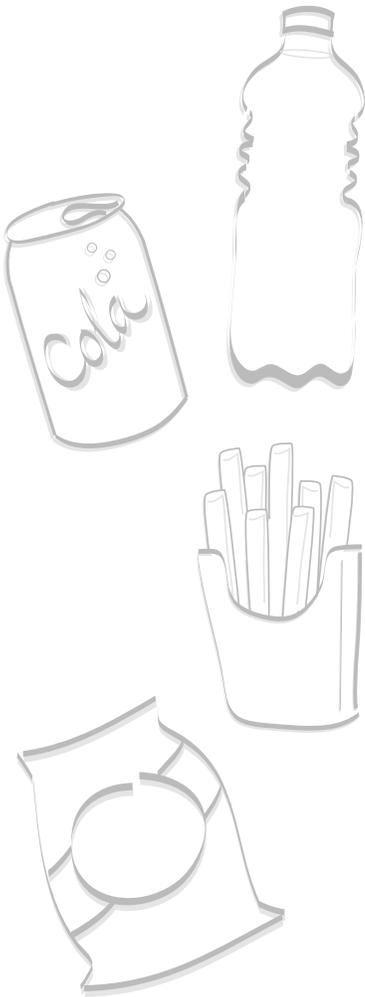
RESOURCES

- *Nutrition Facts Label: Read the Label Youth Outreach Campaign*
www.fda.gov/Food/LabelingNutrition/ucm281746.htm
- FDA's Interactive Label
www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/#downloadables
- MyPlate website
www.choosemyplate.gov
- Physical Activity Guidelines for Americans
<https://health.gov/dietaryguidelines/2015/guidelines/appendix-1/>
- Food Serving Sizes Get a Reality Check
www.fda.gov/ForConsumers/ConsumerUpdates/ucm386203.htm

UP NEXT

Now that you know more about serving sizes, let's take a look at some nutrients to get less of. ▶▶▶

This module introduces nutrients to get less of, some foods and beverages that may contain nutrients to limit, and how to use the Nutrition Facts label to identify them.



BACKGROUND INFORMATION: PART 1



Understanding Carbohydrates introduces these nutrients with a special focus on Sugars.

ACTIVITY



Sugar in Beverages challenges students to examine the sugar content in a variety of familiar drinks.



Time to Tune In

FDA online video clip (for youth) *Your Food Is Trying To Tell You Something*

www.fda.gov/food/labelingnutrition/ucm420953.htm

BACKGROUND INFORMATION: PART 2



All About Sodium discusses what sodium is, where it is found, and how to limit its intake.

ACTIVITY



Sodium in Snack Foods uses some favorite snack foods as a springboard to examine sodium content.

Remember the Nutrients to Get Less Of.

Get less than 100% DV of these each day:

- Saturated Fat
- Sodium
- Added Sugars
- *Trans* Fat

Note: Added Sugars and *Trans* Fat are nutrients to limit, but *trans* fat has no %DV. So, use grams to compare the amount of *trans* fat in foods.

Nutrients to get less of are not intended to be reduced in isolation, but as a part of a healthy eating pattern with a variety of foods and beverages within calorie needs.





BACKGROUND INFORMATION

PART 1

Understanding Carbohydrates

Carbohydrates include sugars, starches, and fibers. The recommended daily value for all carbohydrates is 300 grams (based on a 2,000 calorie daily diet). Although most people consume enough carbohydrates, many people consume too much added sugar and refined starches and not enough fiber.

About Sugars

Sugars are the smallest and simplest type of carbohydrate. They are easily digested and absorbed by the body. There are two types of sugars, and most foods contain some of each kind.

Single sugars (**monosaccharides**) are small enough to be absorbed directly into the bloodstream. They include:

- Fructose
- Glucose
- Galactose

Sugars that contain two molecules of sugar linked together (**disaccharides**) are broken down in your body into single sugars. They include:

- Sucrose (table sugar) = glucose + fructose
- Lactose (milk sugar) = glucose + galactose
- Maltose (malt sugar) = glucose + glucose

About Starches

Starches are made up of many glucose units linked together into long chains. Starches are found naturally in foods such as vegetables (e.g., potatoes, carrots), grains (e.g., brown rice, oats, wheat, barley, corn), and beans and peas (e.g., kidney beans, garbanzo beans, lentils, split peas). Refined starches (e.g., corn starch) can be added to foods during processing or cooking as thickeners and stabilizers.

About Fiber

Fiber, or dietary fiber, is a type of carbohydrate made up of many sugar molecules linked together. But unlike other carbohydrates (such as starch), dietary fiber is bound together in such a way that it cannot be readily digested in the small intestine. Dietary fiber is found in bran, whole grain foods (such as whole grain breads, cereals, pasta, and brown rice), fruits, vegetables, beans and peas, and nuts and seeds.

TIPS Ingredients on the Nutrition Facts label are listed in descending order by weight – the closer they are to the beginning of the list, the more of that ingredient is in the food.



MODULE 2: NUTRIENTS TO GET LESS OF

BACKGROUND INFORMATION



Sugars: A Closer Look

Where are they found?

Sugars are found naturally in many nutritious foods and beverages. They are also added to foods and beverages during processing and preparation, or are consumed separately.

Naturally occurring sugars are found in a variety of foods, including:

- Fruits (fresh, frozen, dried or canned in 100% fruit juices)
- 100% fruit juices
- Dairy products
- Vegetables

Added sugars are often found in foods such as:

- Baked goods, such as cakes, cookies, pies, doughnuts, sweet rolls, and pastries
- Candy
- Dairy desserts, such as ice cream, other frozen desserts, and puddings
- Sugar-sweetened beverages, such as soft drinks, sweetened coffee and tea, energy drinks, alcoholic beverages, and flavored beverages
- Sugars, jams, syrups, and sweet toppings

What Sugars Do

Sugars provide calories and supply energy for the body. Each gram of sugar provides 4 calories. Your body breaks down sugars into glucose. Glucose in the blood (often referred to as blood sugar) is the primary energy source for your cells, tissues, and organs. Your body can use this glucose immediately, or it can store small amounts in your liver and muscles to use when needed later.

Sugars (both naturally occurring and those added to foods and beverages) increase the risk of cavities (also known as “dental caries”). In addition, consuming high levels of added sugar from products such as packaged foods and beverages can contribute to excess calories with little nutritional benefit.

Identifying Added Sugars

The amount of total sugars listed on the Nutrition Facts label includes those that occur naturally in the food or beverage as well as any added sugars. Added sugars are used to sweeten, preserve, or improve the functional attributes of food, such as viscosity, texture, body, color, and browning capability. Added sugars are included on the ingredient list on food and beverage packages. Some examples are: brown sugar, corn sweetener, corn syrup, dextrose, fructose sweetener, fruit juice concentrates, glucose, high fructose corn syrup, honey, invert sugar, lactose, maltose, malt syrup, maple syrup, molasses, pancake syrup, raw sugar, sucrose, trehalose, and turbinado sugar.



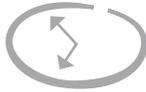
Remember: “Added Sugars” in grams and as percent Daily Value (%DV) is required on the new Nutrition Facts label. They are part of the “Total Sugars” shown, not more sugars. The new label has “Total Sugars,” while the original label only had “Sugars.”



Nutrition Facts	
8 servings per container	
Serving size 2/3 cup (55g)	
Amount per serving	
Calories	230
	% Daily Value*
Total Fat 8g	10%
Saturated Fat 1g	5%
Trans Fat 0g	0%
Cholesterol 0mg	7%
Sodium 160mg	
Total Sugars 12g	10%
Includes 10g Added Sugars	20%
Protein 5g	15%
Vitamin D 2mcg	45%
Calcium 200mg	6%



SUGAR IN BEVERAGES



TIME One 45-Minute Class Period



ACTIVITY AT A GLANCE

In this activity, students will learn how to determine the amount of calories and sugars in different beverages. After completion of the activity, students will gain an appreciation of how many calories and how much sugar is in the beverages they are consuming. This will hopefully lead to an increase in students' awareness of how consumption of sugar-sweetened beverages can impact overall diet and calorie needs. Note: This activity uses table sugar to represent all the different kinds of sugars in the beverages.



TIME TO TUNE IN

Play FDA's online video clip, designed to alert students about Nutrients To Get Less Of.

Your Food Is Trying To Tell You Something
www.fda.gov/food/labelingnutrition/ucm420953.htm



PUBLIC HEALTH CONNECTION

Beverages contribute substantially to overall calorie intake for most people in the U.S. Although they provide needed water, many beverages add calories to the diet without providing important nutrients. They should be consumed in the context of total calorie intake and how they can fit into the eating pattern of each individual. In the U.S., people ages 2 years and older consume an average of about 400 calories per day as beverages.

As the amount of solid fats and/or added sugars increases in the diet, it can be more difficult to also eat foods with sufficient dietary fiber and important vitamins and minerals, and still stay within calorie limits. Although the consumption of solid fats and added sugars among children and adolescents has decreased in recent years, intakes continue to exceed recommended limits. Sugar-sweetened beverages are the largest source of calories from added sugars among children and adolescents. Added sugars account on average for almost 270 calories, or more than 13 percent of total calories per day in the U.S. population. Intakes as a percent of total calories are particularly high among children, adolescents, and young adults.

The *Dietary Guidelines for Americans* recommends that added sugars be limited to less than 10 percent of calories per day. This recommendation is a target that applies to all calorie levels to help individuals move toward healthy eating patterns within calorie limits. In addition, eating patterns characterized by lower intake of sources of added sugars are associated with reduced risk of cardiovascular disease.

MODULE 2: NUTRIENTS TO GET LESS OF

SUGAR IN BEVERAGES



GETTING STARTED

MATERIALS

- Beverages or beverage containers (see list below). You can also use images or photos of individual beverages with their Nutrition Facts labels.
- Resealable plastic bags containing sugar
- Handouts (one for each student)

ADVANCE PREPARATION

Gather beverages or beverage containers for the activity. There is a wide variety of sugar-sweetened beverages on the market. Feel free to use as many or as few for this activity as you would like, but always include one sample of water and one sample of diet soda, each with 0 grams of sugar.

Some suggested beverages to include are:

- Bottle of water
- Can of regular soda
- 20 fl. oz. bottle of regular soda
- Oversized container of soda
- 20 fl. oz. bottle of diet soda
- Coffee drink (frothed and iced, with added sugar and cream). Note: These beverages can be purchased in bottles at most grocery and convenience stores.
- Various juices (mixed vegetable juices, green juices, citrus juices)
- Energy drink
- Lemonade or iced tea drink
- Sports drink
- Chocolate-sweetened milk beverage
- Yogurt smoothie
- Milkshake

Create resealable plastic bags with corresponding amounts of sugar. For each beverage, measure sugar into a bag to represent the exact amount of sugar in the **entire beverage container** according to the Nutrition Facts label. (Note: The container may contain more than one serving.)

TIP Depending on the size of the class, you can do this activity as a demonstration, as a whole group, or split the class into groups and give each group their own set of materials.

To determine the number of teaspoons of sugar in each beverage:

1. Find the amount of sugars on the Nutrition Facts label. Determine the number of servings in 1 container of the product. Multiply the number of grams of sugars times the number of servings in each container to get the total amount of sugars per container.
2. There are 4.2 grams of sugar in 1 teaspoon. Divide the grams of sugar calculated in step 1 above by 4.2 to determine the number of teaspoons of sugar in the beverage container.
3. If you have a gram scale, you can weigh out precisely the number of grams of sugar (same as the grams of carbohydrates for most products), and place the sugar in separate resealable plastic bags. If you do not have a scale that is capable of measuring gram weights, use the answer you received from the calculation in #2 to measure out the number of teaspoons of sugar in each beverage with a household teaspoon measure and place in separate resealable plastic bags.
4. Label each bag of sugar with a letter that corresponds with a numbered beverage container. Label each beverage container with a number that corresponds to each lettered bag of sugar.
5. Create a handout that students can use to match the lettered bags of sugar with the corresponding numbered beverage containers, or use the handout provided on page 20 of this guide. Make one copy for each student.



MODULE 2: NUTRIENTS TO GET LESS OF

SUGAR IN BEVERAGES

INTRODUCTION

Engage the students by asking them to name their favorite drink. Record the list on the board. Go back through the list and ask students if they consider each beverage to be high in sugar. Add student responses to the list on the board.

Continue the discussion by asking students:

- *How much energy (calories) do carbohydrates supply?*
- *What are the different kinds of carbohydrates?*
- *Which carbohydrates are more nutrient-dense?*
- *What do you think is the recommended daily value for all carbohydrates?*
- *How much sugar would you expect to find in a can of soda, an energy drink, etc.?*
- *How many grams of sugar do you think are in this bag?* (Hold up one bag.)

DID YOU KNOW?

Insider Facts for Discussion

- Beverages such as lemonade and sports drinks usually have less sugar when compared to the same quantity of regular soda.
- Larger amounts of the same sweetened beverage have more calories, so if you want to consume a particular sweetened beverage, consider selecting a smaller container.
- Even though juices contain some nutrients, juices (even 100% juices) can contribute just as many calories to your diet as other sweetened beverages.
- Sweetened beverages like soda typically contain little or no nutrients.

PROCEDURE

Arrange the beverages and the bags of sugar so that students can circulate around them.

1. Have the students look at each beverage container and use their handouts to record which bag of sugar they believe goes with each beverage container.
2. Once finished, discuss which bag of sugar correctly matches each container.
3. Ask for volunteers to read the amount of sugar on the Nutrition Facts label on each of the beverages. Have the class calculate the number of teaspoons of sugar in each of the products.

MODULE 2: NUTRIENTS TO GET LESS OF

SUGAR IN BEVERAGES



REVIEW

Ask students:

- **How much energy (calories) do carbohydrates supply?** (4 calories per gram)
- **What are the different kinds of carbohydrates?** (starches, sugars, and fiber)
- **Which carbohydrates are more nutrient-dense?** (starches and fiber)
- **What is the daily value for all carbohydrates based on a 2,000-calorie diet?** (300 grams. However, for a 2,500-calorie diet, the daily value for all carbohydrates is 375 grams.)
- **How do the total sugar and added sugar in beverages affect your body and overall health?** (Consuming more calories than one burns leads to weight gain.)
- Remind students: Sodium, saturated fat, and added sugars are not intended to be reduced in isolation, but as a part of a healthy dietary pattern that is balanced, as appropriate, in calories.

Continue the discussion by asking:

- **Which drinks have the most total and added sugar? Which have the least sugar?**
- **Were you surprised by any of the findings?**
- **What changes could you make in your choices of beverages?**

- **Why is it important to read the labels of the foods and beverages you consume?**
- **What are some ways to limit added sugar intake?**
 - Choose foods that are more nutrient-dense. Nutrient-dense foods include fruits, vegetables, dairy products, lean meats and poultry, seafood, eggs, unsalted nuts and seeds, and whole grains.
 - Look for added sugars on the ingredient list on a food package or on the Nutrition Facts label. Limit foods that are high in added sugar, and if you do eat them, consume smaller portions. These foods, such as grain-based and dairy desserts and sweet snacks, tend to be higher in calories and low in valuable nutrients.
 - Choose whole fruit (fresh, frozen, dried, or canned in 100% fruit juice) as snacks, salads, or desserts.
 - Try unsweetened or no-sugar added versions of fruit sauces (e.g., applesauce) and yogurt.
 - Instead of sugars, syrups, and other sweet toppings, use fruit to top foods such as cereal and pancakes.
 - More often, choose options such as water or fat-free (skim) or low-fat (1%) milk. Less often, choose options that are high in calories but have few or no beneficial nutrients, such as energy drinks, fruit drinks, soft drinks, and sports drinks.
 - Limit the amount of sugar you add to foods when cooking, baking, or at the table.

(See page 60 for an optional printable Student Review Worksheet)

EXTENSIONS

1. Keep a beverage diary.
2. Have students create posters to advertise healthy beverage choices.
3. Review advertisements and packaging for beverages; identify marketing strategies and their influences on our choices.
4. Measure sugar in beverages not included in the activity. For example: Beverages that kids are curious about, regional or cultural favorites (such as “sweet tea”), or the beverages that are most popular among students.
5. Incorporate math into the activity for exploration of additional nutrients (beyond just sugar):
 - Identify other nutrients in the beverages and calculate the percent of daily recommended intake of these nutrients.
 - Foster the discussion: Many students have something to drink in place of other snacks, and even a meal in some cases. Ask your students if they drink anything that is more nutrient-dense than options with “empty” calories. As an exercise, students could compare and contrast desired nutrients, such as protein, calcium, and vitamins, in beverages with varying nutrient density.

SUMMARY

Choosing beverages carefully is just as important as choosing foods wisely. Many beverages contain added sugars. Use the Nutrition Facts label to help you determine how much total and added sugar a beverage contains and to help you make better beverage choices.

UP NEXT

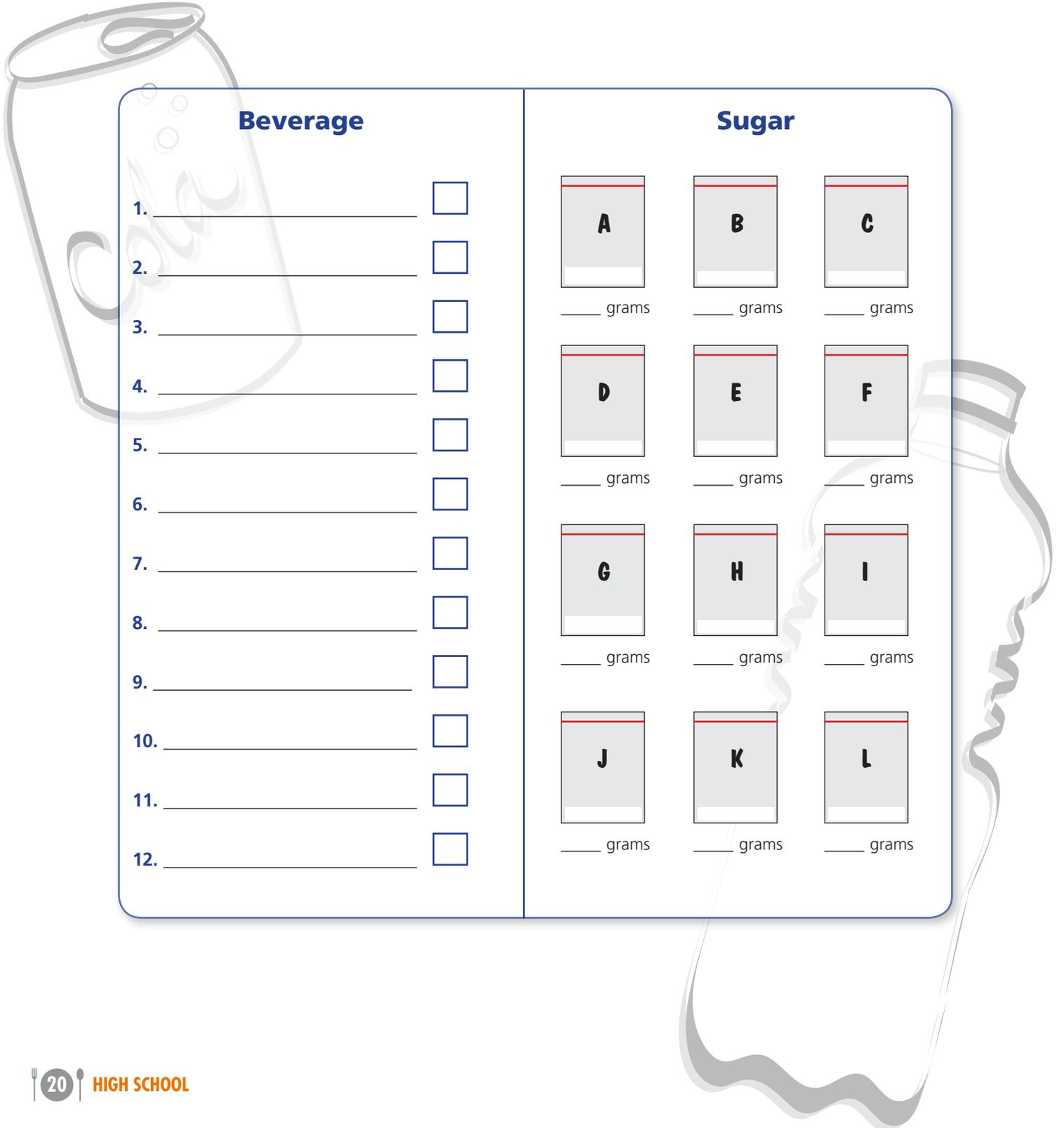
Now that you know about beverages that contain surprisingly large amounts of added sugar, let's take a look at everyday snacks and the amount of sodium they really contain. ▶▶▶

STUDENT WORKSHEET

HOW MUCH SUGAR IS IN YOUR DRINK?

Name _____ Date _____ Class/Hour _____

Do your best to match the letter on each bag of sugar with the number on each beverage with the same amount of sugar. Keep in mind that two of the beverages contain the same amount of sugar.



Beverage	Sugar
1. _____ <input type="checkbox"/>	 A ____ grams  B ____ grams  C ____ grams
2. _____ <input type="checkbox"/>	 D ____ grams  E ____ grams  F ____ grams
3. _____ <input type="checkbox"/>	 G ____ grams  H ____ grams  I ____ grams
4. _____ <input type="checkbox"/>	 J ____ grams  K ____ grams  L ____ grams
5. _____ <input type="checkbox"/>	
6. _____ <input type="checkbox"/>	
7. _____ <input type="checkbox"/>	
8. _____ <input type="checkbox"/>	
9. _____ <input type="checkbox"/>	
10. _____ <input type="checkbox"/>	
11. _____ <input type="checkbox"/>	
12. _____ <input type="checkbox"/>	

MODULE 2: NUTRIENTS TO GET LESS OF

BACKGROUND INFORMATION



PART 2

All About Sodium

Sodium is an essential nutrient and is needed by the human body in relatively small amounts (provided that substantial sweating does not occur). Sodium maintains a balance of body fluids, keeps muscles and nerves running smoothly, and helps certain organs work properly.

As a food ingredient, sodium has multiple uses, such as for curing meat, baking, thickening, retaining moisture, enhancing flavor (including the flavor of other ingredients, like making sweets taste sweeter), and as a preservative.

Salt and Sodium Defined

The words “salt” and “sodium” are often used interchangeably, but they do not mean the same thing. Salt (also known by its chemical name *sodium chloride*) is a crystal-like compound that is abundant in nature and is used to flavor and preserve food. Sodium is a mineral and one of the chemical elements found in salt.

Most people in the U.S. eat too much salt. Salt contains sodium, and too much sodium can raise blood pressure – which can have serious health consequences if not treated.

- The daily recommendation for sodium is less than 2,300 mg per day.
- The average daily intake of sodium for Americans 2 years and older is about 3,440 mg.
- The amount of sodium the body needs each day is 1,500 mg.

The **Nutrition Facts label** on food and beverage packages is a useful tool for making healthy dietary choices and monitoring how much sodium is in a food. Many restaurant websites also have nutrient information for their menu items.

FDA requires nutrition information about a food that has a nutrient claim, such as “low sodium.” In addition, in the future, FDA will require certain nutrition information, including information on sodium, on standard menu items in many restaurants and similar retail food establishments.

Most of the sodium consumed by Americans comes from the following foods:

- Breads and rolls
- Pizza
- Sandwiches
- Cold cuts and cured meats
- Soups
- Burritos and tacos
- Savory snacks*
- Chicken
- Cheese
- Eggs and omelets

*Chips, popcorn, pretzels, snack mixes, and crackers

DID YOU KNOW?

Salt

Salt is the main source of sodium for most people, but some common food additives – like monosodium glutamate (MSG), sodium bicarbonate (baking soda), sodium nitrite, and sodium benzoate – also contain sodium and contribute (in lesser amounts) to the total amount of “sodium” listed on the Nutrition Facts label.

Surprisingly, some foods that don’t taste salty can still be high in sodium, so don’t use taste as a guide. For example, while some foods that are high in sodium taste salty – like pickles and soy sauce – there are also many foods, like cereals and pastries, which contain sodium but don’t taste salty. In addition, some foods that you may eat several times a day, such as breads, can add up to a lot of sodium even though an individual serving may not be high in sodium.

Sodium chloride or table salt is approximately 40% sodium. Understand just how much sodium is in salt so you can take measures to control your intake.



1 teaspoon salt = 2,300 mg sodium



BACKGROUND INFORMATION

Check the Label!

High levels of sodium may seem “hidden” in packaged food, particularly when a food doesn’t “taste” salty – but sodium is not hidden on the Nutrition Facts label!

- The Nutrition Facts label lists the Percent Daily Value (%DV) of sodium in **one serving** of a food.
- The DV for sodium has been slightly lowered to 2,300 mg for the new Nutrition Facts label.
- Often, one package of food may contain more than one serving. So, if a package contains two servings and you eat the entire package, you have consumed twice the amount of sodium listed on the label (in other words, you’ve consumed double the %DV).

Use the Percent Daily Value (%DV) to compare sodium in different products. The %DV tells you whether a food contributes a little or a lot to your total daily diet.

- 5% DV or less of sodium per serving is low
- 20% DV or more of sodium per serving is high



The original label uses a DV of 2,400 mg for sodium, but the new label will use a DV of 2,300 mg for sodium. The %DV for sodium on any label is based on the DV, either 2,300 mg or 2,400 mg.

Check the Package for Nutrient Claims

You can also check the food package to quickly identify foods that may contain less sodium. For example, look for foods with claims such as:

Salt/Sodium-Free	Less than 5 mg of sodium per serving
Very Low Sodium	35 mg of sodium or less per serving
Low Sodium	140 mg of sodium or less per serving
Reduced Sodium	At least 25 percent less sodium than the regular product
Light in Sodium or Lightly Salted	At least 50 percent less sodium than the regular product
No-Salt-Added or Unsalted	No salt is added during processing – but beware, these products may not be salt/sodium-free unless stated

DID YOU KNOW?

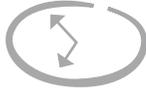
POTASSIUM HELPS!

Research shows that eating foods that are a good source of potassium can lower blood pressure by reducing the adverse effects of sodium on blood pressure. Examples of foods with more potassium include:

- bananas
- beet greens
- juices (carrot, pomegranate, prune, orange, and tomato)
- non-fat and low-fat yogurt
- potatoes
- spinach
- sweet potatoes
- tomatoes and tomato products
- white beans



SODIUM IN SNACK FOODS



TIME One 45-Minute Class Period



ACTIVITY AT A GLANCE

In this activity, students will look at the amount of sodium in snack foods and learn about the recommended amount of sodium they should consume on a daily basis.

GETTING STARTED

MATERIALS

- Snack foods or food images (see list below)
- Table salt
- Resealable plastic bags
- Activity images and **Sodium in Snack Foods Student Worksheet** on page 27 (one for each student)
- Copies of FDA's Fact Sheet: **Sodium in Your Diet — Use the Nutrition Facts Label and Reduce Your Intake**

TIP

Check out *Nutrition in Action* on page 25 for Sodium and Percent Daily Value tips. It makes a great handout!

OVERVIEW

Small bags of salt, prepared in advance, are used to represent the amount of sodium in the food. Students will look at each bag of salt and on their handout, write which bag of salt goes with which of the snack foods. You can do this activity as a whole class activity or split the class into small groups.

There is a wide variety of snack foods on the market. For this activity, you should use those foods that your students most likely eat. Some suggested snacks (shown on the handout) are:

- medium banana (7 to 7.9 inches long; approximately 118 grams)
- 12 ounce can of diet soda
- 3 ounce bag of sunflower seeds
- 1.5 ounce bag of regular potato chips
- 1 ounce bag of baked potato chips
- 1 large order of fast food fries (approximately 5.6 ounces)
- 1 ounce of pretzels (thin, classic)
- 1 smoked beef stick – approximately 1 ounce
- 1 8-ounce can of vegetable juice

ADVANCE PREPARATION

1. You will need small, resealable plastic bags and table salt to create bags with the amount of sodium in each snack food. For this activity, bags measuring 2 inches x 2 inches could be used. (These can be found at craft stores.)

To determine the amount of salt for each resealable bag:

- Find the amount of sodium in one serving on the snack's Nutrition Facts label, or from a website such as <http://ndb.nal.usda.gov/ndb/search>
 - Use a milligram scale to weigh out the amount for each bag, and write the amount on each bag.
2. Make student copies of FDA's Fact Sheet: **Sodium in Your Diet — Use the Nutrition Facts Label and Reduce Your Intake**, which can be downloaded from the following website: www.fda.gov/Food/LabelingNutrition/ucm315393.htm



MODULE 2: NUTRIENTS TO GET LESS OF

SODIUM IN SNACK FOODS

INTRODUCTION

Virtually all Americans consume more sodium than they need. Sodium is primarily consumed as salt (sodium chloride).

Engage your students by either asking students the following questions or giving them copies of FDA's Fact Sheet: **Sodium in Your Diet — Use the Nutrition Facts Label and Reduce Your Intake**. Ask them what their favorite snacks are. Next, ask them:

- *What is sodium?*
- *What important functions does sodium have in the body?*
- *What effect does sodium have on blood pressure?*
- *How much sodium do most people consume daily?*
- *Which foods contain the most sodium?*

PROCEDURE

Use the handout for the suggested snacks on page 27, and have the students match the bags of salt with the images of the snack food and record their answers on the worksheet.

1. Have students match the snack food images with the amount of sodium and record their answers on their worksheets.
2. Once finished, discuss which bag of sodium (salt) correctly matches each image.

REVIEW

Ask students:

- *What is the recommended daily limit for sodium?* (2,300 mg)
- *Where does most of the sodium in our diet come from?* (Over 70% of dietary sodium comes from processed and packaged foods.)
- *What foods are higher in sodium, and what foods have less sodium?* (Most of the sodium consumed by Americans comes from the following foods: Breads and rolls, pizza, sandwiches, cold cuts and cured meats, soups, burritos and tacos, savory snacks [chips, popcorn, pretzels, snack mixes, and crackers], chicken, cheese, and eggs and omelets. Fresh fruits and vegetables are examples of foods that are lower in sodium.)
- *What are some ways to reduce sodium intake?* (See next page.)

(See page 60 for an optional printable Student Review Worksheet)

PUBLIC HEALTH CONNECTION

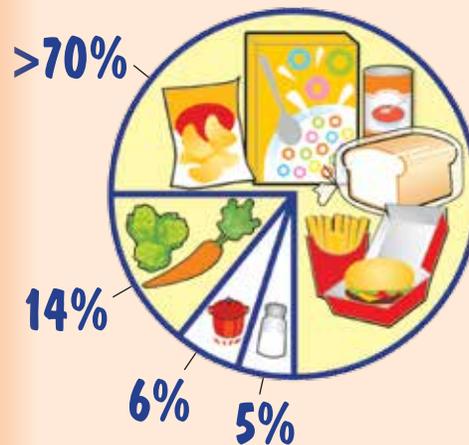
According to the CDC, high blood pressure (hypertension) is a key risk factor for heart disease, which kills about 610,000 Americans each year. Eating a high sodium, low potassium diet increases risk for hypertension.

The Surprising Truth about Sodium Consumption

Despite what many people think, use of the salt shaker is not the main cause of too much sodium in your diet.

Americans' sodium intake breaks down like this:

- **Over 70%** comes from processed and packaged foods
- **14%** is naturally occurring in foods
- **6%** comes from adding salt to food in home preparation
- **5%** is added at the table



NUTRITION IN ACTION

Start the Shake-Down: Easy Tips for Cutting Sodium

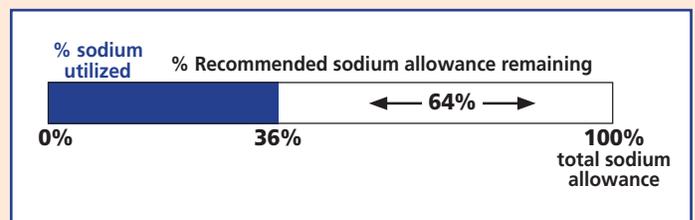
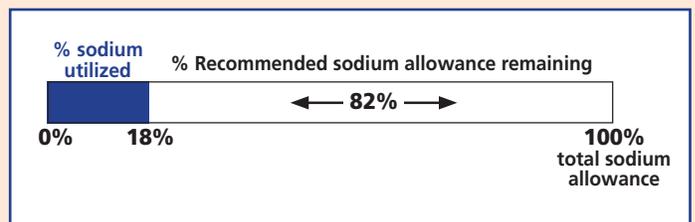
Learning about sodium in foods and exploring new ways to prepare foods will help you achieve your sodium goal. And, if you follow these tips for reducing the amount of sodium you are consuming, your “taste” for sodium will gradually decrease over time – so eventually, you may not even miss it!

1. Read the Nutrition Facts label to see how much sodium is in the foods you are considering. Most people should consume less than 100% of the Daily Value of sodium each day. Check the label for lower sodium choices and compare sodium in different brands of foods — like frozen meals, packaged soups, breads, dressings/sauces, and snack foods — and choose those with lower sodium.
2. Prepare your own food when you can. Limit the amount of salt you add to foods when cooking, baking, or at the table, and limit packaged sauces, mixes, and “instant” products, including flavored rice, instant noodles, and ready-made pasta.
3. Add flavor without adding sodium. Use no-salt seasoning blends and herbs and spices instead of salt to add flavor to your foods. Try rosemary, oregano, basil, curry powder, cayenne pepper, ginger, fresh garlic or garlic powder (not garlic salt), black or red pepper, vinegar or lemon juice, and no-salt seasoning blends.
4. Get fresh when you can. Buy fresh or frozen meat and poultry, rather than canned, smoked, or processed meat and poultry such as luncheon meats and sausages. Also, check the package on fresh meat and poultry to see if salt water or saline has been added.
5. Watch your veggies. Buy fresh, frozen (no sauce or seasoning), or low sodium or no-salt-added canned vegetables.
6. Give sodium the “rinse.” Rinse sodium-containing canned foods, such as tuna, vegetables, and beans before eating. This removes some of the sodium.
7. “Unsalt” your snacks. Choose nuts, seeds, and snack products (such as chips and pretzels) that are marked “low sodium” or “no salt added” – or have carrot or celery sticks instead.
8. Consider your condiments. Sodium condiments can add up. Choose light or reduced sodium condiments, add oil and vinegar to salads rather than bottled dressings, and use only a small amount of seasoning from flavoring packets instead of the entire packet.
9. Make lower-sodium choices at restaurants. Ask for your meal to be prepared without salt and request that sauces and salad dressings be served “on the side,” then use less of them. You can also reduce your portion size – less food means less sodium! For example, split an entrée with a dinner companion or ask the server to put half of your meal in a take out container before it comes to your table.

A Quick Guide to %DV

- 5% DV or less per serving is low for all nutrients, including those you want to limit (for example, saturated fat, cholesterol, and sodium), as well as those that you want to consume in greater amounts (e.g., fiber and calcium).
- 20% DV or more per serving is high for all nutrients.

Balancing daily needs example: If the label shows that the sodium in one serving is 18% DV, is that amount contributing a lot or a little to your recommended daily amount for sodium of 100% DV? What if you ate the whole package (i.e., two servings)? You would then double that amount, eating 36% of your recommended daily amount for sodium. That means you still should aim to get less than 64% of your recommended sodium ($100\% - 36\% = 64\%$) from all of the other foods you eat that day, snacks and drinks included.





MODULE 2: NUTRIENTS TO GET LESS OF

SODIUM IN SNACK FOODS

EXTENSIONS

1. You might want your students to look at the amount of salt in their snack foods. Some chemistry background and math calculations will be needed to determine the amount of salt in the food. Your students can refer to the Periodic Table of Elements to learn that the atomic mass of sodium (Na) is 23 and of chlorine (Cl) is 35.5. The molecular mass of sodium chloride (NaCl), therefore, is 58.5. Of this total mass, 0.40 or 40% is sodium (23 divided by 58.5).

To calculate the amount of salt in a food, divide the mg of sodium by 0.40. For example, if the food contains 55 mg of sodium, then 55mg divided by 0.40 equals 138 mg of salt. This activity requires resealable plastic bags that measure 3 inches x 3 inches (these can be found in craft stores).

2. As an alternative activity, or in coordination with the sodium activity, you could have the students look at the saturated fat (grams) and the number of calories in each of the snack foods. The students could then use these three sets of data to determine the most nutrient-dense foods (healthy snacks).

One way the students could do this would be to rank the foods from lowest to highest in the amount of sodium; then with the number of calories; and finally, with the saturated fat. For example, students can look at one sample of vegetable juice with 70 calories, no fat, and 677 mg of sodium (28% DV). This would not be a good choice. If they were to consider a banana (with 105 calories, 1 mg of sodium, and 0 grams of saturated fat), then this would be a better choice. Use the data table on page 27 of this Guide, or create your own.

SUMMARY

Sodium is an essential nutrient, but Americans often consume too much sodium. Be mindful of salt intake to preserve a healthy heart and optimal health.

- Add foods with potassium to improve health.
- Read the Nutrition Fact labels to determine the amount of sodium in the foods you eat.
- At the grocery store, try to find different foods with less sodium.

RESOURCES

- FDA Fact Sheet: Sodium in Your Diet — Use the Nutrition Facts Label and Reduce Your Intake (FDA/CFSAN): www.fda.gov/Food/LabelingNutrition/ucm315393.htm

UP NEXT

So now that you know more about nutrients to get less of, let's plan a meal – paying attention to the nutrients to get more of. ▶▶▶

Student Worksheet *Sodium in Snack Foods Answer Key:*

- E – Banana
- D – Diet soda
- G – Baked potato chips
- H – Sunflower seeds
- F – Regular potato chips
- K – Large fries
- A – Smoked beef stick
- C – Pretzels
- B – Vegetable juice
- L – Amount of sodium your body needs
- I – Recommended amount of sodium per day
- J – Average American intake of sodium

1. What is sodium? (*Sodium is a mineral and one of the chemical elements found in table salt.*)
2. How much sodium does the body need in order to function each day? (*1,500 mg*)
3. What is the recommended daily limit for sodium? (*2,300 mg*)
4. What is the average daily intake of sodium by Americans over 2 years old? (*about 3,440 mg*)
5. How does a diet high in sodium contribute to heart disease? (*It contributes to hypertension.*)
6. How can you reduce sodium in your diet? (*See Easy Tips on page 25 of this guide.*)

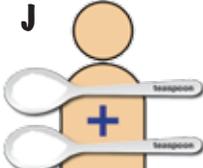
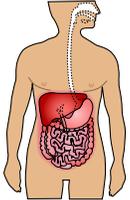
Snack Food	Calories	Sodium (Na)	Salt (NaCl)	Saturated Fat
Sunflower Seeds (3-ounce bag)	260	190 mg (8% DV)	475 mg	2.5 g (13% DV)
Regular Potato Chips (1.5-ounce bag)	220	270 mg (11% DV)	675 mg	1.5 g (8% DV)
Baked Potato Chips (1-ounce bag)	120	135 mg (9% DV)	338 mg	0 g (0% DV)
Large Fries (5.6 ounces)	510	290 mg (12% DV)	725 mg	3.5 g (17% DV)
Pretzels (1 ounce of thin, classic)	110	490 mg (19% DV)	1225 mg	0 g (0% DV)

STUDENT WORKSHEET

SODIUM IN SNACK FOODS

Name _____ Date _____ Class/Hour _____

Do your best to match the milligrams of sodium on each bag to the picture of the snack food. Fill in the table below.

Milligrams of Sodium	Snack Food
1 mg <input type="checkbox"/>	A  Smoked Beef Stick (1 stick)
40 mg <input type="checkbox"/>	B  Vegetable Juice (8 ounces)
135 mg <input type="checkbox"/>	C  Pretzels (1 ounce)
190 mg <input type="checkbox"/>	D  Diet Soda (8 ounces)
270 mg <input type="checkbox"/>	E  Medium Banana (7 - 7.9 inches)
290 mg <input type="checkbox"/>	F  Regular Potato Chips (1.5 ounces)
480 mg <input type="checkbox"/>	G  Baked Potato Chips (1 ounce)
490 mg <input type="checkbox"/>	H  Sunflower Seeds (3 ounces)
677 mg <input type="checkbox"/>	I  Recommended Amount Per Day
1,500 mg <input type="checkbox"/>	J  Average American intake of Sodium
Less than 2,300 mg <input type="checkbox"/>	K  Large Fries (5.6 ounces)
About 3,440 mg <input type="checkbox"/>	L  Amount of Sodium Your Body Needs

1. What is sodium? _____
2. How much sodium does the body need in order to function each day? _____
3. What is the recommended daily limit for sodium? _____
4. What is the average daily intake of sodium by Americans over 2 years old? _____
5. How does a diet high in sodium contribute to heart disease? _____

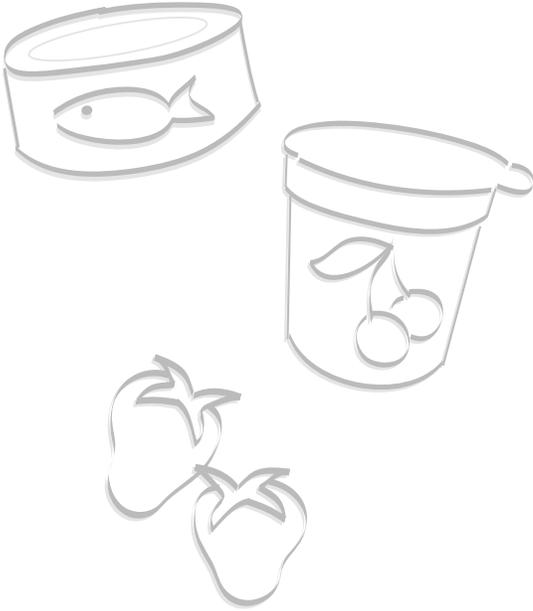
6. How can you reduce sodium in your diet? _____

Optional Extension Activity

Snack Food	Calories	Sodium (Na)	Salt (NaCl)	Saturated Fat
Sunflower Seeds (3-ounce bag)				
Regular Potato Chips (1.5-ounce bag)				
Baked Potato Chips (1-ounce bag)				
Large Fries (5.6 ounces)				
Pretzels (1 ounce of thin, classic)				

NUTRIENTS TO GET MORE OF

This module introduces nutrients to get more of, some foods and beverages that are more nutrient-dense (good to consume), and gives students a chance to plan a meal using Nutrition Facts labels.



BACKGROUND INFORMATION



This section offers helpful information for choosing nutrient-rich foods and beverages as part of a healthy overall daily diet plan.

ACTIVITY



Meal Planning engages students in putting the Nutrition Facts label to use by reading the label to plan a healthy breakfast.



Time to Tune In

Replay FDA's online video clip, *Your Food Is Trying To Tell You Something*.

www.fda.gov/food/labelingnutrition/ucm420953.htm

Remember the list of Nutrients to Get More Of

Get 100% DV of these on most days:

- Calcium
- Dietary Fiber
- Iron
- Vitamins A, C, and D
- Potassium



Use the **Nutrition Facts** label as your tool to consume a healthful, nutrient-dense diet.



The original Nutrition Facts label includes the Percent Daily Value (%DV) for dietary fiber, vitamin A, vitamin C, calcium, and iron. On the original Nutrition Facts label, including potassium and vitamin D is voluntary unless a claim is made or it is added to food.

The new Nutrition Facts label includes the %DV for dietary fiber, vitamin D, calcium, iron, and potassium.



BACKGROUND INFORMATION

A healthy eating pattern is not a rigid prescription, but rather a range of options that can include cultural, ethnic, traditional, and personal preferences, taking into account food cost and availability. There is flexibility in making choices to create a healthy eating pattern that meets nutrient needs and stays within calorie limits.

A healthy eating pattern focuses on nutrient-dense foods. Nutrient-dense foods and beverages contain vitamins, minerals, dietary fiber, and other substances that may have positive health effects, while contributing relatively few calories.

Strategy for a Nutrient-Dense Diet

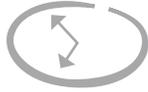
To achieve a nutrient-dense diet, eat a variety of foods and beverages within calorie needs, including:

- fruits and vegetables
- whole grains
- fat-free or low-fat dairy products
- lean meats and poultry
- eggs
- seafood
- beans and peas
- soy products
- unsalted nuts and seeds

Good Sources of Nutrients To Get More Of			
<p>Calcium</p> <ul style="list-style-type: none"> • Canned seafood with bones (such as salmon and sardines) • Dairy products • Fortified cereals and juices • Fortified soy and almond beverages • Green vegetables (such as spinach, kale, broccoli, turnip greens) • Tofu (made with calcium sulfate) 	<p>Vitamin A</p> <ul style="list-style-type: none"> • Cantaloupe • Carrots • Eggs • Fortified cereals • Green leafy vegetables (such as spinach and broccoli) • Milk and milk products • Pumpkin • Red peppers • Sweet potatoes 	<p>Dietary Fiber</p> <ul style="list-style-type: none"> • Beans and peas (such as navy beans, split peas, lentils, pinto beans, and black beans) • Bran • Fruits and vegetables • Nuts • Whole grains 	<p>Vitamin C</p> <ul style="list-style-type: none"> • Broccoli • Brussels sprouts • Cantaloupe • Citrus fruits and juices (such as oranges and grapefruit) • Kiwifruit • Peppers • Strawberries • Tomatoes and tomato juice
<p>Iron</p> <ul style="list-style-type: none"> • Beans and peas • Meat • Poultry • Prunes and prune juice • Raisins • Seafood • Spinach • Whole grain and enriched cereals and breads 	<p>Vitamin D</p> <ul style="list-style-type: none"> • Eggs • Fish (e.g., herring, mackerel, salmon, trout, and tuna) • Fish liver oil • Fortified cereals • Fortified dairy products • Fortified margarine • Fortified orange juice • Fortified soy beverages 	<p>Potassium</p> <ul style="list-style-type: none"> • Bananas • Beet greens • Juice (carrot, pomegranate, prune, orange, and tomato) • Oranges and orange juice • Potatoes and sweet potatoes • Prunes and prune juice • Spinach • Tomatoes and tomato products • White beans • Yogurt (plain) 	



MEAL PLANNING



TIME One 45-Minute Class Period



ACTIVITY AT A GLANCE

In this activity, students will plan a healthy meal – breakfast – using the Percent Daily Value. Students will use the Nutrition Facts label to evaluate and compare foods as they plan their meals.



TIME TO TUNE IN

Nutrition Facts Label Video Clip

For reinforcement, replay FDA's online video clip, *Your Food Is Trying To Tell You Something*. www.fda.gov/food/labelingnutrition/ucm420953.htm

PUBLIC HEALTH CONNECTION

- **Calcium** is important for blood clotting, bone and teeth formation, constriction and relaxation of blood vessels, hormone secretion, muscle contraction, and nervous system function.
- **Iron** is important for energy production, growth and development, immune function, red blood cell formation, reproduction, and wound healing.
- **Potassium** can lower blood pressure by reducing the adverse effects of sodium on blood pressure.
- **Dietary fiber** can help increase frequency of bowel movements and can reduce your risk of developing cardiovascular disease.
- **Vitamin A** is important for growth and development, immune function, reproduction, red blood cell formation, skin and bone formation, and vision.
- **Vitamin C** is important as an antioxidant and for collagen and connective tissue formation, immune function, and wound healing.
- **Vitamin D** is important for bone health.



GETTING STARTED

MATERIALS

- Meal Planning Handouts – Power of Choice Nutrition Facts Cards (online or printed, URL may change)
www.fns.usda.gov/sites/default/files/NutritionLabels.pdf
This link includes a Nutrition Facts label template if you want to add other choices.
- FDA’s Nutrition Information for Raw Fruits, Vegetables, and Seafood (online or printed)
www.fda.gov/Food/LabelingNutrition/ucm063367.htm

ADVANCE PREPARATION

Before beginning the lesson, decide how students will access the nutrition information for the foods they will use as they plan their meal. Students can access nutrition information either online (websites listed above) or as printed materials. Plan ahead so that students have access to computers to find the information, or print enough materials for your class for this lesson. Common breakfast foods are listed on the right in case you would like to use these along with the FDA fruit, vegetable, and seafood nutrition information charts (website below) for this activity.

Alternatively, you could bring clean, empty food containers for breakfast foods, such as yogurt, eggs, milk, and cereals, for your students to use.

Fruit, Vegetable, and Seafood Information

Nutrition facts for fruit, vegetable, and seafood choices are shown in the FDA nutrition charts at www.fda.gov/Food/LabelingNutrition/ucm063367.htm

Common Breakfast Foods

Nutrition Facts labels for common breakfast items are available from the *Power of Choice* website www.fns.usda.gov/sites/default/files/NutritionLabels.pdf

- Bacon
- Bagel
- Bread, whole wheat
- Biscuit
- Butter
- Cereal, corn flakes
- Cereal, oatmeal
- Cheese, cream
- Doughnut, glazed
- Egg, hard cooked
- Fruit juice, orange with calcium
- Fruit juice, tomato
- Jelly
- Margarine, tub
- Milk, 0% fat
- Muffin, plain
- Potato, hash browns
- Toaster pastry
- Waffle, plain, frozen
- Yogurt, low-fat with fruit



MODULE 3: NUTRIENTS TO GET MORE OF

MEAL PLANNING

INTRODUCTION

This meal planning exercise will let you try to “cook up” a healthy breakfast. Engage students by asking:

- *What is your favorite breakfast?*
- *What do you like about it?*
- *What nutrients do you think are in your breakfast?*
- *What do you think you need to get more of to help get your day started?*
- *Are there any important nutrients you might be missing?*

Note: If many students skip breakfast, the class could discuss some possible breakfast options that are fast, convenient, healthy, and tasty. Please be aware that students may have varied access to breakfast foods, and some students might use the School Breakfast Program.

PROCEDURE

1. Each group should use the resources available to construct one breakfast meal. The meal should be part of a 2,000-calorie daily plan, so they could aim for about 500–600 calories. (Remember that your students typically need between 1,400 to 3,200 calories a day; however, calorie needs vary.)
Remind students that if they plan to consume multiple servings of any of the items, they need to multiply the calories and nutrients in their tallies, too.
2. In addition to recording the number of servings and calories, have students record nutrient data in percentages (i.e., the %DV of each nutrient that the food contributes). Remember to include any beverages and condiments.
3. Have each of the student groups share its breakfast meal with the whole class. Make sure the groups tell which foods they chose and why they chose those particular foods. Remind the groups that this breakfast meal is only one part of a 2,000-calorie day.
4. For each group’s meal, the students should answer the following questions:
 - a. What is your cumulative %DV consumed for: calcium, dietary fiber, iron, vitamin A, vitamin C, vitamin D, and potassium?
 - b. Which nutrients do you need to get more of?
 - c. What is the total number of calories in your group’s meal?
 - d. Did you use the ingredient list?

REVIEW

- *Where on the Nutrition Facts label can you find serving size and servings per container? Why are these important to know?* (Serving size and servings per container are found toward the top of the Nutrition Facts label. It’s important to know how many servings are in a container since sometimes one container has multiple servings.)
- *How can you find how much energy you can get from a food? Why is it important to know the amount of energy you get from a food?* (The calories per serving tell you how much energy you can get from food. Consuming the right amount of calories in a day helps you to survive and thrive, as well as maintain a desirable body weight.)
- *How do you use %DV to determine which nutrients in the food are low and which are high? What are nutrient-dense foods?* (5% DV or less of a nutrient per serving is low, and 20% DV or more of a nutrient per serving is high. Nutrient-dense foods and beverages contain vitamins, minerals, dietary fiber, and other naturally occurring substances that may have positive health effects, while contributing relatively few calories.)
- *Which of the breakfast foods reported was the most nutrient-dense food? Which was the least nutrient-dense? What values did you use to determine this?* (Encourage the students to be as specific as possible.)

(See page 61 for an optional printable Student Review Worksheet.)

MODULE 3: NUTRIENTS TO GET MORE OF

MEAL PLANNING



DID YOU KNOW?

Insider Facts for Discussion

- **Comparisons:** The %DV makes it easy for you to make comparisons. You can compare one product or brand to a similar product. Just make sure the serving sizes are similar, especially the weight (e.g., grams, milligrams, ounces) of each product's serving size. It's easy to see which foods are higher or lower in nutrients because the serving sizes are generally consistent for similar types of foods, except in a few cases like breakfast cereals (which vary in density).
- **Nutrient Content Claims:** Use the %DV to help you quickly distinguish one claim from another, such as "reduced fat" vs. "light" or "nonfat." Just compare the %DVs in each food product to see which one is higher or lower in a particular nutrient – there is no need to memorize definitions. This works when comparing all nutrient content claims (e.g., less, light, low, free, more, high, etc.) for nutrients you either want to get more of or less of.
- **Dietary Trade-Offs:** You can use the %DV to help you make dietary trade-offs with other foods throughout the day. You don't have to give up a favorite food to eat a healthy diet. When a food you like is high in a nutrient you want to get less of – or low in a nutrient you want to get more of – balance it with foods that are low (or high) in that nutrient at other times of the day.

EXTENSIONS

1. Choose Nutrients Wisely. Pick foods that are higher in "nutrients to get more of," and lower in "nutrients to get less of." When comparing Percent Daily Value (%DV), remember: 5% DV or less per serving is low; 20% DV or more per serving is high!
2. Add Your Choices to the Family Shopping List. Read the label on foods and beverages in the pantry and refrigerator. Then, add items to the shopping list that are higher in nutrients to get more of and lower in nutrients to get less of.
3. Show Your "Smarts" In the Cafeteria. Look for the Nutrition Facts label on food packages like milk and milk products, snacks and other foods, and go for the ones that are high in nutrients to get more of and low in nutrients to get less of.

SUMMARY

A healthy eating pattern focuses on nutrient-dense foods. Many people need to get more of the following nutrients: calcium, dietary fiber, iron, vitamin A, vitamin C, vitamin D, and potassium.

The %DV on the Nutrition Facts label is a great tool for seeing how much of each of these nutrients are in a single serving of a food or beverage option. Eat more foods that are good sources of the nutrients you need to get more of.

RESOURCES

- FDA's Interactive Label:
www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/#downloadables
- MyPlate website:
www.choosemyplate.gov

STUDENT WORKSHEET

MEAL PLANNING – BREAKFAST

Name _____ Date _____ Class/Hour _____

Directions: Use available Nutrition Facts label resources to create a healthy breakfast. Be sure to factor in the number of servings you plan to consume. Describe the breakfast below and record the nutrition facts.

Food Name								
Calories/Serving								
Serving Size								
# of Servings Consumed								
Totals: (nutrient value x number of servings)								
Total calories								
Total fat								
Saturated fat (%DV)								
<i>Trans fat</i> *								
Cholesterol (%DV)								
Sodium (%DV)								
Total Carbohydrate (%DV)								
Dietary Fiber (%DV)								
Sugars*								
Added Sugars (if available)								
Total Protein*								
Vitamin A (%DV)								
Vitamin C (%DV)								
Vitamin D (%DV)								
Calcium (%DV)								
Iron (%DV)								
Potassium								

*While the Nutrition Facts label does not list a %DV for *trans* fat, sugars, or total protein, you can record the grams of sugars and total protein and the milligrams or grams of *trans* fat for these.

	<p>What is your cumulative breakfast %DV for each of the following:</p> <p>Vitamin A _____</p> <p>Vitamin C _____</p> <p>Vitamin D _____</p> <p>Calcium _____</p> <p>Iron _____</p> <p>Potassium _____</p>	
	<p>What is your cumulative breakfast %DV for each of the following:</p> <p>Saturated fat _____</p> <p>Sodium _____</p> <p>Added sugars (if available) _____</p> <p><i>Trans</i> fat _____</p>	

A CLOSER
LOOK AT FATS

This module introduces fat terminology, discusses the connection between health and dietary fats, and highlights engaging activities for students to learn about fats in foods.

BACKGROUND INFORMATION



This module describes the role of fats in food and in the body, and how they serve as a source of energy and calories. It provides information on different types of fats that are listed on the Nutrition Facts label – including monounsaturated, polyunsaturated, and saturated fats – and defines *trans* fat and cholesterol. The module also includes dietary guidance for fat consumption.

ACTIVITY



Get the Facts about Fats! helps students identify which types of fats are found in different foods and how food choices may impact health. It also includes comparing the Nutrition Facts labels on different food products to see how the fat content differs.

**Time to Tune In**

The following videos provide a good overview of the types of fats and their health benefits as well as health risks:

Types of Fats – What is Saturated Fat – What is Unsaturated Fat

www.youtube.com/watch?v=2cuaQRZJfFo

The Deal with Fat by SciShow

www.youtube.com/watch?v=mvvx2yQRbzQ

Khan Academy – This site includes both text and videos related to fats

www.khanacademy.org/science/biology/macromolecules/lipids/v/molecular-structure-of-triglycerides-fats

www.khanacademy.org/science/biology/macromolecules/lipids/v/molecular-structure-of-triglycerides-fats

DID YOU KNOW?

The *Dietary Guidelines for Americans* recommends that 4 to 18 year olds get 25-35% of their daily calories from fat, with saturated fat contributing less than 10% of daily calories.



BACKGROUND INFORMATION

TERMINOLOGY

Lipids are a large group of organic compounds that are oily to the touch and insoluble in water. Lipids include fats, oils, and waxes and are a source of stored energy.

The terms **lipids** and **fats** are often used interchangeably. Fats are also called triglycerides, because they are usually made up of three fatty acids and a glycerol molecule. For this module, we will use the term “fat” to represent all dietary lipids.

Solid fats contain more saturated fatty acids and/or *trans* fats than liquid oils. **Oils** are usually liquid at room temperature, high in monounsaturated or polyunsaturated fatty acids, and lower in saturated fatty acids than solid fats.

Understanding Dietary Fat

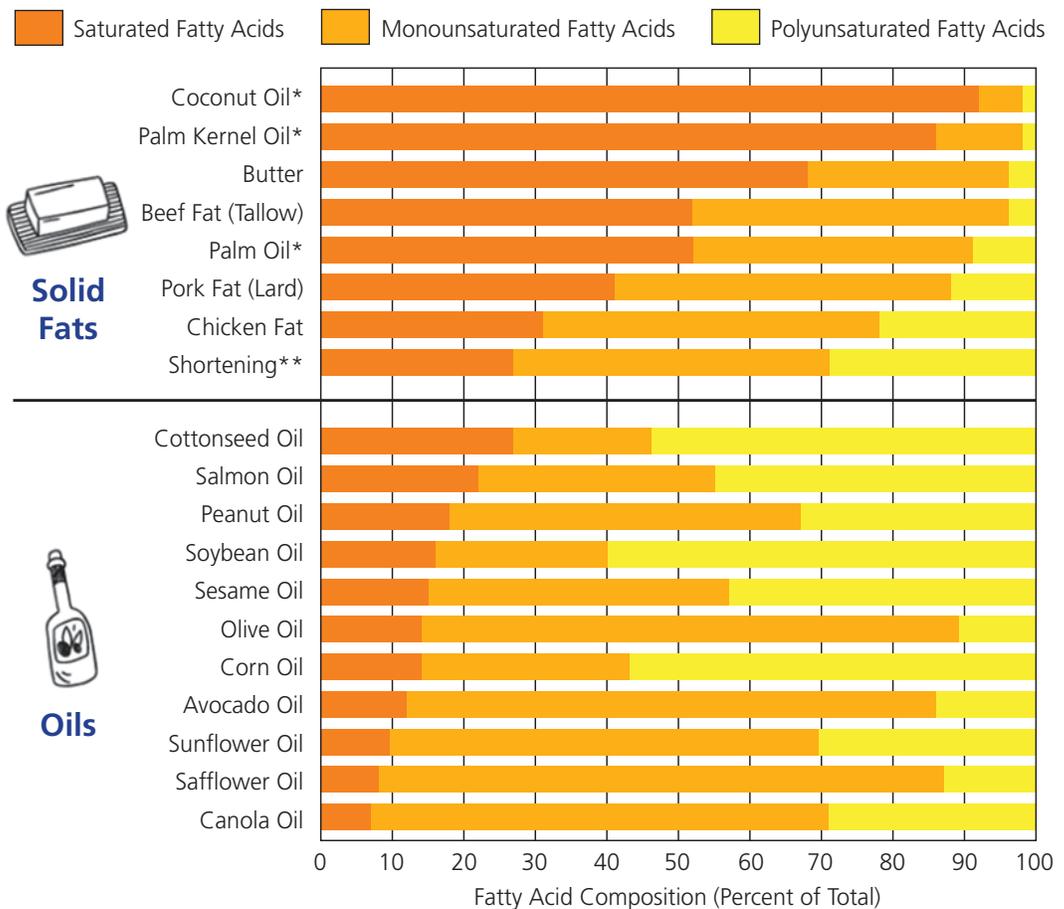
Dietary fats are found in both plant and animal foods, and they are broken down into fatty acids during digestion. All dietary fats are composed of a mix of saturated, monounsaturated, and polyunsaturated fatty acids, in varied proportions. For example, most of the fatty acids in butter are saturated, but it also contains some monounsaturated and polyunsaturated fatty acids. Fat is also a source of essential fatty acids (linoleic acid and alpha-linolenic acid) which the body cannot synthesize and therefore must obtain from the diet.

Are all fats created equally?

No. The FDA has allowed the following health claim to be made about fats:

Diets low in saturated fat and cholesterol may reduce your risk of heart disease.

Fatty Acid Profiles of Common Fats and Oils



*Coconut, palm kernel, and palm oil are called oils because they come from plants. However, they are solid or semi-solid at room temperature due to their high content of short-chain saturated fatty acids. They are considered solid fats for nutritional purposes.

**Shortening may be made from partially hydrogenated vegetable oil, which contains *trans* fatty acids.

Dietary Guidelines for Americans 2015 - 2020.

BACKGROUND INFORMATION

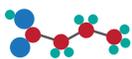


Fat in foods is a major source of energy for the body and aids in the absorption of the fat-soluble vitamins A, D, E, and K. Fats are also important for proper growth and maintenance of good health, since they play a role in the structure and function of cell membranes, the integrity of skin, maintaining healthy blood cells, and fertility. As a food ingredient, fats provide taste, consistency, and stability and help us feel full.

The recommended daily amount of fats to eat is about 30% of total daily calories, with saturated fats contributing less than 10% of daily calories. **All fat has 9 calories per gram**, making it a concentrated source of energy, so it should be eaten in moderation. Although most people consume enough fat, many people consume too much saturated and *trans* fat and not enough unsaturated fat. **The Nutrition Facts label is a useful tool for checking how much, and what kind of fat is in a food.**

About Saturated Fatty Acids

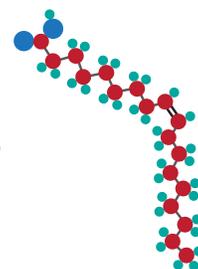
Saturated fats are typically found in animal products, and dietary fats that have more saturated fatty acids tend to be solid at room temperature. They are called “saturated” because all the spaces on the fat molecule that can hold a hydrogen atom do so and are “full” – that is, the molecule is “saturated” with hydrogen atoms. Saturated fats taste good and reduce hunger, but eating too much of them increases the risk of cardiovascular disease. Saturated fatty acids are found in the greatest amounts in animal fats (including beef, pork, lamb, and poultry with skin), full fat dairy products (butter, cream, cheese and ice cream), many sweet desserts (cakes and cookies), fried foods, and some plant-based oils, such as coconut oil, palm oil, and palm kernel oil. The human body makes all the saturated fat that it needs, so it is not necessary to consume any additional saturated fat. In fact, saturated fats are not essential nutrients at all. The body can also synthesize fat from carbohydrates and protein.



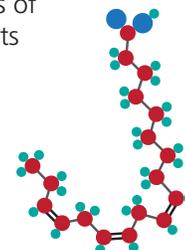
About Unsaturated Fatty Acids – Heart Healthy Fats!

Unsaturated fatty acids include monounsaturated and polyunsaturated fatty acids. They are found in higher proportions in plants and seafood. They are called “unsaturated” because some of the carbon atoms in the fat molecule do not hold a hydrogen atom. Monounsaturated fatty acids have one double bond in the fat molecule, and polyunsaturated fatty acids have more than one double bond. Oils that are high in unsaturated fatty acids are not considered to be a separate food group, but are important because they can reduce the risk of developing cardiovascular disease when eaten in place of saturated fat.

- **Monounsaturated fatty acids (MUFAs)** are found in relatively large amounts in olive, canola, safflower, and sunflower oils, as well as in avocados, peanut butter, and most nuts. There is no recommended daily intake of MUFAs.



- **Polyunsaturated fatty acids (PUFAs)** are found in vegetable oils and fatty fish such as salmon, mackerel, and sardines. PUFAs are a good source of omega-3 and omega-6 fatty acids, which are the two primary types of essential fatty acids (EFAs). EFAs are nutrients required for normal body functioning, but they cannot be made by the body and must be obtained from food. The body uses this fat to build cell membranes, nerve tissue (including the brain), and to regulate hormones.



Replacing Solid Fats with Oils

Unsaturated fats and oils should replace saturated fats, rather than just being added to the diet. This allows the total amount of fat consumed to remain within recommendations, without exceeding daily calorie limits. While unsaturated fatty acids are optional to be listed on Nutrition Facts labels, they are considered part of the total fat category. **A gram of unsaturated fat is healthier than a gram of saturated fat, but both have the same number of calories: 9 calories per gram.**

TEACHER NOTE

For more about Saturated Fats, refer to the *Dietary Guidelines for Americans 2015-2020* summary https://health.gov/dietaryguidelines/2015/resources/DGA_Cut-Down-On-Saturated-Fats.pdf



BACKGROUND INFORMATION

About *Trans* Fats, A Danger Zone!

Trans fat is an unhealthy fat found primarily in partially hydrogenated vegetable oils and foods containing these oils. Although *trans* fatty acids are unsaturated, they are structurally similar to saturated fatty acids and therefore behave like them. For nutritional purposes, *trans* fat is considered a solid fat due to its multiple health dangers. Its consumption is directly linked to an increased risk of cardiovascular disease. Some *trans* fat occurs naturally in animal products but most is human-made. It has been used in food products to improve texture and help food last longer.

FDA will ban most uses of artificial *trans* fat by 2018, but it might be found in some very small quantities in a few processed foods. Products that have fewer than 0.5 grams of *trans* fat per serving do not have to list it on their label, but this hidden fat can add up if you eat several servings of products that contain it. "Partially hydrogenated oil" in the ingredient list indicates the food contains *trans* fat. People should check the Nutrition Facts label and the ingredient list to limit as much as possible their intake of *trans* fat.

Fatty Acid Composition and Melting Point

Unsaturated fatty acids have one or more double bonds in their carbon chains. Most naturally-occurring unsaturated fatty acids have their hydrogen atoms on the same side of the double bond, which is known as the "*cis*" configuration ("*cis*" means "on this side"). This type of geometry produces a kink at the double bond which causes the carbon chains to bend so they cannot become closely aligned. When fatty acids are separated from each other like this, they have weak intermolecular interactions and tend to form liquids.



Fat vs. Fatty Acid

Many consumer education and outreach efforts, as well as the Nutrition Facts label, use the term "Fat" in place of "Fatty Acid" for Total Fat, Saturated Fat, Mono- and Polyunsaturated Fat, and *Trans* Fat.

Thus, products such as olive oil and canola oil are liquid at room temperature and are said to have a low melting point. The melting point is the temperature at which a solid fat "melts" and becomes liquid. A melting point below room temperature (70° F) is considered "low." The melting points of different fatty acids vary, depending on the position of the double bond(s) and the length of the carbon chain.

In contrast to naturally-occurring unsaturated fatty acids, industrially produced *trans* fatty acids have their hydrogen atoms on opposite sides of the double bond ("*trans*" means "across"), which does not result in a kink at the double bond or cause bending. The carbon chains of *trans* fatty acids remain relatively straight, like the configuration of saturated fatty acids. Thus, *trans* and saturated fatty acids can pack together tightly with relatively little space between them, so their intermolecular interactions are stronger which results in a more solid structure. Therefore, foods such as butter and animal fats are solid at room temperature and have higher melting points; i.e., they don't become liquid unless exposed to higher temperatures. In addition, longer chain saturated fatty acids have higher melting points than shorter chain saturated fatty acids.

Fatty Acid Chain Length

In addition to whether they are saturated or unsaturated, fatty acids are categorized by their chain length. Most naturally occurring fatty acids have an unbranched chain with an even number of carbon atoms (between 4 and 28).

- Short-chain fatty acids have 6 or fewer carbon atoms.
- Medium-chain fatty acids have 8 – 12 carbons. These are the most common types.
- Long-chain fatty acids have more than 12 carbons.
- Very long-chain fatty acids have 22 or more carbons and make up only a small percentage of the total fatty acid content of most foods.

BACKGROUND INFORMATION



About Cholesterol

Cholesterol is a waxy, fat-like substance made by all cells of the body. The organs that make the most cholesterol are the liver and intestines. Cholesterol helps produce vitamin D and certain hormones like estrogen and testosterone, and is necessary to produce bile, a fluid that aids in fat digestion. Cholesterol in food is referred to as “dietary cholesterol” and is found only in animal products, never in plants. Cholesterol is transported in the blood by particles called “lipoproteins,” which contain both fat and protein. Over time, cholesterol and other substances can build up in the arteries and cause cardiovascular problems. The human body makes all the cholesterol that it needs, so it is not necessary to get cholesterol from food.

HDL & LDL Cholesterol

- **High Density Lipoprotein (HDL)** cholesterol is often referred to as “good” cholesterol. HDL cholesterol travels from the body tissues to the liver, where it is broken down

and removed. Higher levels of HDL cholesterol in the blood can help prevent cholesterol buildup in blood vessels, decreasing the risk of developing cardiovascular disease.

- **Low-density Lipoprotein (LDL)** cholesterol is often referred to as “bad” cholesterol. It is the form that moves cholesterol from the liver to the arteries and body tissues. Higher levels of LDL in the blood can lead to a harmful cholesterol buildup in blood vessels, increasing the risk of cardiovascular disease.

Foods such as meats and dairy products that are high in dietary cholesterol are also high in saturated fats. This combination can increase the risk of developing cardiovascular disease. The Nutrition Facts label is a good tool for monitoring consumption of cholesterol. The goal for consumption is to get less than 100% of the Daily Value for cholesterol each day. Remember, you don’t have to eat any cholesterol at all, because your body makes it.

PUBLIC HEALTH CONNECTION

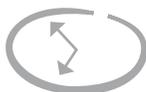
- Developing healthy eating habits during adolescence can help reduce the risk of major chronic diseases. A healthy diet includes limiting saturated fat and *trans* fat and eating unsaturated fat in moderation.
- Saturated and *trans* fats raise LDL (or “bad”) cholesterol levels in the blood, which can increase the risk for heart disease. Dietary cholesterol also contributes to heart disease. Unsaturated fats, such as monounsaturated and polyunsaturated fat, do not raise LDL cholesterol and are beneficial when substituted for saturated fat and consumed in moderation. Therefore, it is advisable to choose foods low in saturated fat, *trans* fat, and cholesterol as part of a healthful diet, and include sources of omega-3 and omega-6 fatty acids, such as fish and olive oil.
- If fats aren’t burned as energy or used as building blocks, they are stored by the body in fat cells. So, fats should be consumed in moderation to maintain a healthy weight.

DID YOU KNOW?

HDL cholesterol and LDL cholesterol are only found in blood, not in food. They are the cholesterol carriers. So you can’t “look for” foods high in HDL and low in LDL to optimize your diet. In addition, regular aerobic exercise may increase levels of HDL cholesterol in the blood.



GET THE FACTS ABOUT FATS!



TIME Two 45-minute class periods



ACTIVITY AT A GLANCE

In this activity, students will identify fats and oils to learn about their functions and related health concerns. Students will use fact sheets from FDA's Interactive Label website to distinguish between different kinds of dietary fats, their characteristics, food sources, and health connections. Students will then construct models of saturated and unsaturated fat molecules.



Time to Tune In

Types of Fats – What is Saturated Fat – What is Unsaturated Fat
www.youtube.com/watch?v=2cuaQRZJfFo

The Deal with Fat by SciShow
www.youtube.com/watch?v=mvvx2yQRbzQ

GETTING STARTED

MATERIALS

Make a copy of Student Worksheet for the Interactive Label Fact Sheet Research and Student Worksheet for Fat Modeling for each student.

Part 1: Interactive Label Research – Get the Facts about Fats!

Note: This assignment could be completed in class or given as a homework assignment.

Printed fact sheets or online access to FDA's Interactive Label pages for Saturated Fat, Monounsaturated and Polyunsaturated Fat, *Trans* Fat, and Cholesterol www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/#downloadables

Part 2: Saturated and Unsaturated Fat Modeling

Each group will construct 5 saturated fatty acid chain models and 5 unsaturated fatty chain models with 10 carbons each.

- 3 different colored miniature items, such as marshmallows, small Styrofoam balls, gum drops, playdough, etc. (320 pieces per group total: 100 carbon atoms, 200 hydrogen atoms, and 20 oxygen atoms for the 10 models)
- Flat toothpicks cut in half: 300 pieces per group
- 12" ruler
- Worksheet for students to record data

TEACHER NOTE

For sturdier molecule models, allow miniature marshmallows to dry for a day or two before use.

GET THE FACTS ABOUT FATS!



ADVANCE PREPARATION

Gather a variety of food samples composed mainly of fat for display. A clear bottle of cooking oil and a container of shortening are good choices. (Use caution: Do not use foods for which students have known food allergies.)

Print out an image of a saturated fatty acid chain and an unsaturated fatty acid chain for each group; or show this short video of saturated and unsaturated fat molecule models: www.youtube.com/watch?v=Cbt-WWJRCqw.

INTRODUCTION

Interactive Label Research

Engage your students by asking the following questions:

Do you think that most Americans consume too much fat? What is the basis of your opinion?

What is fat?

Which of your favorite foods contain fat?

What do you know about the different kinds of fat?

At this time accept all student responses to these questions.

Let's look at the Interactive Nutrition Facts Label fact sheets to find out more about the different kinds of fat. www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/#downloadables

Have students complete the **Student Worksheet for the Interactive Label Fact Sheet Research** and discuss their responses.

Continue with making the models of saturated and unsaturated fat molecules.

Saturated and Unsaturated Fat Modeling

Introduce this activity by saying: Now that you have learned about fat and the different kinds of fat, let's see how saturated and unsaturated fatty acids differ using molecular models. How do you think they will be the same? How do you think they will differ?

If students do not suggest "the amount of space they occupy," give more leading questions.

State: Some fats are really easy to identify as having more saturated or more unsaturated fatty acids because we can see and feel their properties. (Hold up butter and oil.)

Explain: Fats at room temperature come in both solid and liquid form depending on the amounts of different types of fatty acids they contain, but when they are hidden in food they are harder to identify. Today we are going to make models of saturated and unsaturated fatty acids to see how well they pack together.

Remind students: Each carbon atom can form a single bond with four other atoms.

PROCEDURE

Construct models for saturated and unsaturated fatty acids and compare how they pack together.

1. Group students in teams.
2. Review images of a saturated fatty acid chain and an unsaturated fatty acid chain.
3. Demonstrate a single miniature marshmallow (carbon atom) connected to four miniature marshmallows of a different color (hydrogen atoms) to introduce the procedure to be followed to construct the models.

TEACHER NOTE

Teacher Note: Remind students that all dietary fats and oils are composed of a combination of saturated and unsaturated fatty acids.

4. Ask each team to construct 5 saturated fatty acid chains and 5 *cis* unsaturated fatty acid chains, each with 10 carbon atoms, represented by the miniature marshmallows. Add that 1 toothpick should be used to represent a single bond, and 2 toothpicks would be for a double bond.



GET THE FACTS ABOUT FATS!

5. Each team should measure the length of each fatty acid chain. They should try to make the bond length as consistent as possible.
6. Have each team pack their 5 intact saturated fatty acid chain models together and measure the 3-dimensional volume using their ruler.
 - Record this volume on their worksheet.
7. Have each team pack their 5 intact unsaturated fatty acid chain models together and measure the 3-dimensional volume using their ruler.
 - For the unsaturated fatty acid models, have them record the number of double bonds and their position. For consistency, have the whole class count double bond positions from the same end of the fatty acid chain, either the COOH- (carboxyl) end or the CH₃ (methyl) end.
 - Record this volume on their worksheet.
8. Ask what volumes each team had for their saturated fatty acids cluster.
9. Ask students to examine how much their volumes differed for the saturated fatty acid cluster, and discuss any differences.
10. Ask what volumes each team had for their unsaturated fatty acids cluster.
11. Ask students to examine how much their volumes differed for the unsaturated fatty acid cluster, and discuss any differences.
12. Ask: *What difference does it make how far apart the fatty acid chains are apart from one another?*
 - Discuss: *How would this affect melting point?*

- Ask: *How did the number of double bonds affect the final cluster volume?*
- Ask: *How did the position of the double bond(s) affect the final cluster volume?*

How Can I Use the Nutrition Facts Label to Make Heart-Healthy Food Choices?

Check the Nutrition Facts labels for the kinds of fats any given product contains. Recall that the Nutrition Facts label is only required to show total fat, saturated fat, and *trans* fat. Yet, you can figure out the amount of unsaturated fat by subtracting the saturated fat from the total fat. For example, if you look at the Nutrition Facts label on page 9 of this guide, you see that this product has 8 grams of total fat and 1 gram of saturated fat, so it has 7 grams of unsaturated fat.

Evaluation: Making healthy choices is not always possible just by looking at a product. How can you use the Nutrition Facts label to tell which one of the four products below would be the best choice as a spread?

Challenge: You are having a party. Which one of these spreads would be the best choice to use on your rolls and why? Include evidence from what you have learned along with reasoning to support your position. Consider both health and taste concerns in your evaluation.

Students look at the options below. Combine the grams (g) of saturated fat and *trans* fat and look for the lowest combined amount. Check both nutrients to make the best choice.

Butter		Margarine, stick		Margarine, tub		Hummus	
Saturated Fat:	7g	Saturated Fat:	2g	Saturated Fat:	1g	Saturated Fat:	0g
+ <i>Trans</i> Fat:	0g	+ <i>Trans</i> Fat:	3g	+ <i>Trans</i> Fat:	0.5g	+ <i>Trans</i> Fat:	0g
Combined Amount:	7g	Combined Amount:	5g	Combined Amount:	1.5g	Combined Amount:	0g

GET THE FACTS ABOUT FATS!



REVIEW

What are the different types of fat? (Saturated, monounsaturated, polyunsaturated, and *trans*)

What sources are high in saturated fats? Saturated fatty acids (saturated fats) are found in the greatest amounts in coconut and palm kernel oils, in butter and beef fats, and in palm oil. They are also found in other animal fats, such as pork and chicken fats and in fats from plant foods such as nuts.

What are good sources of unsaturated fats? They are found in higher proportions in plants and seafood.

What dietary fats limits are recommended by the Dietary Guidelines? The recommended daily amount of fats to eat is about 30% of total daily calories, with saturated fats contributing less than 10 percent of daily calories. Completely avoid *trans* fats and foods that contain “partially hydrogenated oils” or “shortening” in the ingredient list.

What is the molecular basis for the melting point variation between saturated and unsaturated fatty acids? The bent configuration of *cis* unsaturated fatty acids keeps molecules

SUMMARY

Dietary fats are a good source of energy. Although most people consume enough fat, many people consume too much saturated and *trans* fat and not enough unsaturated fat. You can use the Nutrition Facts label to make smart choices about dietary fat consumption.

further away from each other, which results in weaker intermolecular interactions and lower melting points.

Return to the question: Do you think that most Americans consume too much fat or enough healthy fat? Discuss with the students if their opinions stayed the same or have changed and if so, why.

(See page 62 for an optional printable Review Worksheet)

EXTENSION

Lipids Activity: This interactive activity allows students to learn about the differences in molecular structure between solid and liquid fats. For teachers looking for a focus on the molecular structure of fats, this is an excellent activity. The game has icons you can click on for learning or reviewing information. Students who know little about fats can learn as they progress. www.ck12.org/assessment/tools/geometry-tool/plix.html?eld=SCI.BIO.214&questionId=546a8a335aa413612dcfe6ea&artifactID=1824138&backUrl=http%3A//www.ck12.org/search/%3Fq%3Dfats%26referrer%3Dtop_nav%26autoComplete%3Dfalse%23interactive

RESOURCES

- *Dietary Guidelines for American 2015-2020*
https://health.gov/dietaryguidelines/2015/resources/2015-2020_dietary_guidelines.pdf
- FDA's Interactive Nutrition Facts Label Sheets (downloadables)
www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/#downloadables
- Harvard Health Publications: *The truth about fats: the good, the bad, and the in-between*
August 2015
www.health.harvard.edu/staying-healthy/the-truth-about-fats-bad-and-good
- Hidden Fats www.fatsecret.com/calories-nutrition/usda/hard-salted-pretzels?portionid=62057&portionamount=45

UP NEXT

Now that you know more about fats, let's use what you've learned to plan meals away from home.



STUDENT WORKSHEET

ACTIVITY 1 – INTERACTIVE LABEL FACT SHEET RESEARCH

Name _____ Date _____ Class/Hour _____

Use the following link to complete this chart:

www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/#downloadables

Kind of Fat	Health Benefits	Health Risks	Sources	Characteristics
Saturated				
Monounsaturated				
Polyunsaturated				
Trans				

1. Fat is called the best source of energy. Why? _____
2. Why are fats important for proper growth and health? _____

3. What are the major sources of fat in the diet? _____
4. To reduce the amount of fat in your diet, which foods would you limit and why? _____

5. What are the dietary limits of saturated and *trans* fats and why is this important to know? _____

6. Create a Venn diagram to compare and contrast saturated and unsaturated fats.

STUDENT WORKSHEET

ACTIVITY 2 – SATURATED AND UNSATURATED FATTY ACID MOLECULAR MODELING

Name _____ Date _____ Class/Hour _____

Saturated Fatty Acid Models		Unsaturated Fatty Acid Models			
Length	Cluster volume	Length	# Double bonds	Double bond position(s)	Cluster volume
1.		1.			
2.		2.			
3.		3.			
4.		4.			
5.		5.			

How much difference was there between the cluster volume of your saturated fatty acids and the cluster volume for your unsaturated fatty acids?

Why is it important to know about the amount and kind of fat in food?

Look at the Nutrition Facts label on page 8. Under which category are saturated and *trans* fats listed? Why are they included in this category?

This module teaches students how to support healthy eating patterns through finding and using nutrient information when eating away from home at restaurants and similar settings. It also introduces students to the nutrient/calorie information available for vending machine foods and beverages.

TEACHER NOTE

The date for covered establishments to comply with Menu Labeling requirements is May 7, 2018.

BACKGROUND INFORMATION: PART 1



This module highlights awareness of consuming nutrients and calories away from home and where to find the calorie and nutrition information for the foods served in fast food restaurants. It also highlights how to determine individual calorie needs and the number of calories in a typical fast food meal, and it focuses on dietary goals for saturated fat and sodium.

ACTIVITY



Two Meals on the Go! will help students locate the nutrition information for their favorite fast food restaurants, accentuating the calories eaten, nutrients to get less of, and nutrients to get more of.



Time to Tune In

WebMD: Healthy Eating When Dining Out slideshow

www.webmd.com/diet/ss/slideshow-healthy-eating-out

HEALTHY EATING PATTERN

A healthy eating pattern includes fruits (especially whole), vegetables (a variety of dark green, red, and orange), protein, dairy, grains, and oils, while limiting saturated fats, *trans* fats, added sugars, and sodium.

Goals*

- Less than 10 percent of calories/day from saturated fats
- Less than 10 percent of calories/day from added sugars
- Less than 2,300 milligrams/day of sodium
- Typically, 1,400 to 2,000 calories/day for children 9 to 13 years old, and 1,800 to 3,200 calories/day for people 14 to 18 years old, but calorie needs vary.

(*from *Dietary Guidelines for Americans 2015 – 2020*)

Note: Menu Labeling requirements do not include added sugars.

BACKGROUND INFORMATION: PART 2

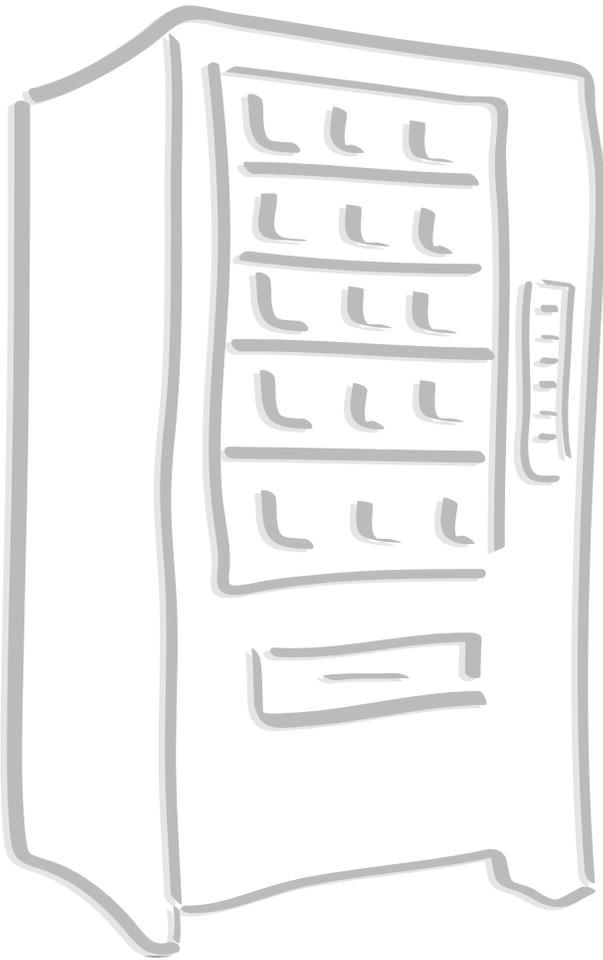


This module directs students' attention to calorie information on vending machine selections. It also focuses on selecting healthy snack options away from home, particularly at school.

ACTIVITY



✓ **Your Snacks** challenges the student to read the nutrition facts for their favorite snack foods and compare them with healthy, nutritious school snacks.



Pay Attention to Portion Size, Serving Size, and Servings per Container

Portion Size is the amount of a food served or consumed during one meal or snack. A portion is not a standardized amount, and the amount considered to be a portion is subjective and varies. **Serving Size** is based on the amount of food that is customarily eaten at one time and is not a recommendation of how much to consume.

Servings per Container shows the total number of servings in the entire food package or container. Often, one package of food may contain more than one serving!

Note: (for packaged vending machine and other labeled items) Products using the new Nutrition Facts label will also use updated serving sizes for many items. For example, the serving size for ice cream has historically been $\frac{1}{2}$ cup, but $\frac{2}{3}$ cup is the serving size that will be used for the new label.

In addition, the calories for vending machine items will be displayed for the entire package unless the nutrition facts label is displayed, and this will be based on the amount usually consumed.



BACKGROUND INFORMATION

PART 1

Restaurants & Stores

Eating Out

Many people enjoy eating meals away from home. Studies show that Americans consume a third of their daily calories away from home at restaurants, fast food establishments, and other food venues. This can make it difficult for families to eat healthy, nutritious meals. How often do you eat out?

There is help now for the consumer when eating out: Calories will be required on certain restaurant menus and menu boards to help consumers to choose healthier options. These covered establishments will also be required to have additional written nutrition information available upon consumer request. The new menu labeling will be consistent nationwide and will provide easy-to-understand nutrition information.

Restaurant Menu Labeling	
Applies to some food/meals/snacks sold at certain	Does not apply to food/meals/snacks sold at/on
Amusement parks	Airplanes
Bakeries	Deli items sold by weight and not listed on a menu board
Restaurants	Food trucks
Coffee shops	Grocery store purchases in bulk
Convenience stores	The USDA National School Lunch program
Drive-through windows	Trains
Take-out establishments	
Fast food restaurants	
Grocery store buffet, deli or sandwich shop	
Ice cream stores	
Movie theaters	

Labeling will be required for restaurants and other similar retail food establishments that are a part of a chain of 20 or more locations and meet certain other criteria.

FDA is also requiring restaurants to include a statement on menus and menu boards reminding consumers that “2,000 calories a day is used for general nutrition advice, but calorie needs vary.”

Note: Many establishments already provide this information for customers.

Why are calories important?

Calories are important in managing your weight. Whether you are trying to lose, gain, or maintain weight, the key is to balance the number of calories you consume with the number of calories your body uses (“burns”).

Where will the calories be located?

Calories will be located clearly on menus and menu boards next to the name or the price of the food or beverage.

For buffets and salad bars, calories will be shown on signs that are visible when selecting the foods.

Calories are not required to be listed for:

- Condiments that are available for general use (such as ketchup packets on the counter)
- Daily specials (such as a chef’s soup special)
- Custom orders (such as a burger with no bun)
- Temporary/seasonal menu items (such as eggnog-flavored latte)

Combination Meals

When combinations of more than one food item are listed together as a meal, such as a hamburger, fries, and a drink and there are three or more options (e.g., more than three drink options), the calories must be shown as a range, for example, 400 - 750 calories.

When there are only two choices of the variable component of that combination meal, such as fries or a side salad, the calories are displayed with a slash, for example, 150/200 calories.

MODULE 5: HEALTHY EATING AWAY FROM HOME

BACKGROUND INFORMATION



What is the additional nutrition information?

The additional written nutrition information must be available on the premises of the covered establishment, and must be provided to customers upon request. This information may be in the form of booklets or on computers (supplied by the establishment), counter cards, handouts, kiosks, posters, tray liners, or signs. The nutrition information may come from nutrient databases, cookbooks, laboratory analyses, or other similar means. The nutrition information must include:

- Total calories
- Calories from fat
- Total fat
- Saturated fat
- *Trans* fat
- Cholesterol
- Sodium
- Total carbohydrates
- Dietary Fiber
- Sugars
- Protein

Online Versus In Person

Menu labeling nutrition information will be required online May 7, 2018, if the restaurant is a covered establishment and the customer can use the online menu to place an order. Not all online menus for covered establishments will include this information unless you are able to place an order online. Some establishments are voluntarily putting this information on their website.

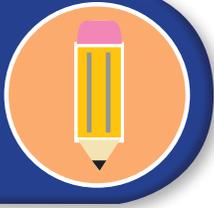
DID YOU KNOW?

When eating out, ask which ingredients are being used to prepare your meal. You can also ask to see nutrition information and then choose menu options that are lower in saturated fat, *trans* fat, cholesterol, sodium, and sugars.

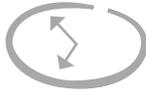
Calorie Conscious Tips for Eating Out

1. Know your calorie needs. Visit www.ChooseMyPlate.gov/getmyplan to determine your personal daily calorie needs.
2. Compare foods. Check posted calorie counts or check calorie counts online before you eat at a restaurant.
3. Choose smaller portions. When possible, pick a smaller portion size, such as a small order of french fries instead of a large, or an appetizer instead of a full-sized entrée.
4. Manage larger portions. Split an entrée with a friend or take home part of your meal.
5. Limit add-ons. Ask for syrups, dressings, and sauces to be served “on the side,” then use less.
6. Choose healthy options. Pick dishes that include more fruits, vegetables, and whole grains and limit foods described with words like creamy, fried, breaded, battered, or buttered (these are typically higher in calories).
7. Watch beverages. More often, choose options such as water or fat-free (skim) or low-fat (1%) milk. Less often, choose options that are high in calories but have few or no beneficial nutrients, such as energy drinks, fruit drinks, soft drinks, and sports drinks.

Source: FDA Fact Sheet: **Calorie Labeling on Restaurant Menus and Vending Machines: What You Need To Know**



TWO MEALS ON THE GO!



TIME Two 45-Minute Class Periods



ACTIVITY AT A GLANCE

In this activity, students will do an Internet search for two meals they would eat from a fast food restaurant and locate the nutrition information for each item in the meal. Students then use this data to determine how healthy their meals are.

Retail Food Safety companion content: If you also teach food safety and/or microbiology, check out the Fast Food Footwork activity (Module 4) in the *Science and Our Food Supply: Investigating Food Safety from Farm to Table-Teacher's Guide for High School Classrooms* for important food safety content for people working behind the counter in fast food establishments.

GETTING STARTED

MATERIALS

Connection to the Internet
 Copies of FDA's Fact Sheet: **Calorie Labeling on Restaurant Menus and Vending Machines – What You Need To Know**
www.accessdata.fda.gov/scripts/InteractiveNutritionFactsLabel/#downloadables
 Menus from various fast food restaurants
 Student Worksheet: **Two Meals on the Go!** (one for each student)

ADVANCE PREPARATION

Note: If technology is not available, obtain or download menus and Nutrition Facts Information from popular fast food restaurants in your area. (See *Optional Resources below for links to menus and Nutrition Facts Information.*)

INTRODUCTION

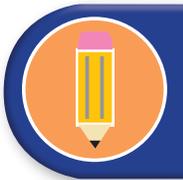
Begin the lesson by displaying the menus from various fast food restaurants. Ask students the following questions:

- Do you like eating out?
- How often do you eat out?
- What is your favorite fast food restaurant?
- What is your favorite meal to eat at this restaurant?
- Have you ever been away from home on a road trip with family, friends, or classmates and had to eat two meals on the go in one day?

Continue the discussion by asking:

- Do you know how many calories were in those meals?
- Do you know how many calories you need each day?
- Are you aware of how much sodium and saturated fat are in those meals?

TWO MEALS ON THE GO!



PROCEDURE

Part A

Have students determine their personal daily calorie needs and their sodium and saturated fat limits by using the calculator at www.choosemyplate.gov/MyPlate-Daily-Checklist-input.

TEACHER NOTE

It is important to be sensitive to the fact that some students may not want to use their own information. Allow these students to make up a student and use his or her information.

Distribute copies of FDA's Fact Sheet: **Calorie Labeling on Restaurant Menus and Vending Machines - What You Need To Know** and have the students read the information.

Ask students: *Has anyone noticed calories displayed on a restaurant menu?*

If so, was it useful to you in making a menu selection?

How would you use menu labeling to make menu selections?

PUBLIC HEALTH CONNECTION

- Over the past century, rates of chronic diseases (many of which are related to poor quality diet and physical inactivity) have increased.
- Following a healthy eating pattern at an appropriate calorie level helps to achieve and maintain a healthy body weight, support nutrient adequacy, and reduce the risk of chronic disease.
- Consuming too many calories can contribute to a variety of health issues, such as obesity and chronic diseases like cardiovascular disease and type 2 diabetes.
- Teenagers who have healthy eating patterns are more likely to perform better at school.
- See complete *Dietary Guidelines for Americans*: <https://health.gov/dietaryguidelines/2015/guidelines>

Part B

1. Distribute copies of the worksheet **Two Meals on the Go!**
2. Have the students record the name of one or two favorite fast food restaurants and the components of two meals (breakfast, lunch or dinner) that they would like to eat or have eaten there.
3. Using the Internet, have the students research two meals and record the appropriate data on the worksheet.
4. Remind students: Only covered establishments must meet the menu labeling requirements and covered establishments are only required to post calories online if the customer can use the online menu to place an order, so not all establishments will have their calorie/nutrition information online. If the information is not online, then the student will need to choose another restaurant.
5. Technology Tip: If necessary, demonstrate for the students how to find the data.
6. Review the Calorie Conscious box in the Food Facts handout with the students. Using these guidelines, instruct students to determine how healthy their meals are and how they can make them more healthy.
7. Ask for volunteers to share their information.
8. Ask students how easy or hard it was to find calorie and nutrition information for their meals.
9. Ask students whether the information was presented in an easily understood format.

OPTIONAL RESOURCES

- (1) Find favorite restaurants' nutrition information: www.nutritionix.com/brands/restaurant
- (2) Get **restaurant nutrition** information from the Calorie Count database. Free calorie information and **menu** analysis for the most popular restaurants: www.caloriecount.com/restaurants-mc1?s_order=a
- (3) Nutrition facts from the most popular fast food restaurants: <http://fastfoodnutrition.org/>
- (4) Nutritional information for fast food chains and restaurants: www.calorieking.com/foods/calories-in-fast-food-chains-restaurants_c-Y2lkPTI.html



TWO MEALS ON THE GO!

REVIEW

Ask students:

Why are calories important? (Calories provide energy for your body. Whether you are trying to lose, gain, or maintain weight, the key is to balance the number of calories you consume with the number of calories your body uses [“burns”].)

Ask students to review the **Calorie Conscious** tips on the Food Facts handout, and ask them:

Which of these are you most likely to use and why?

Which are you least likely to use and why?

Calorie Conscious tips for eating out include:

1. Know your calorie needs. Visit www.ChooseMyPlate.gov/getmyplan to determine your personal daily calorie needs.
2. Compare foods. Check posted calorie counts or check calorie counts online before you eat at a restaurant.
3. Choose smaller portions. When appropriate, pick a smaller portion size, such as a small order of French fries instead of a large, or an appetizer instead of a full-sized entrée.
4. Manage larger portions. Split an entrée with a friend or take home part of your meal.
5. Limit add-ons. Ask for syrups, dressings, and sauces to be served “on the side,” then use less.
6. Choose healthy options. Pick dishes that include more fruits, vegetables, and whole grains and limit foods described with words like creamy, fried, breaded, battered, or buttered (these are typically higher in calories).
7. Watch beverages. More often, choose options such as water or fat-free (skim) or low-fat (1%) milk. Less often, choose options that are high in calories but have few or no beneficial nutrients, such as energy drinks, fruit drinks, soft drinks, and sports drinks.

EXTENSIONS

1. Students could write letters to restaurant chains thanking them for providing useful nutrition information or offering suggestions about how their information could be provided differently if it was hard to use.
2. Students could make posters showing the nutritional information for the two versions of their meal (original and healthier option), including the calorie total of both meals compared with their daily calorie needs. Display posters for others to see.
3. Students could suggest healthier versions of their fast food meals, complete data tables for them and answer similar questions for them as they did for their first sets of meals. Note: See *Science and Our Food Supply: Using the Nutrition Facts Label to Make Healthy Food Choices - Teacher’s Guide for Middle Level Classrooms, 2nd edition*, pages 50-54, for more details on this extension.

SUMMARY

Menu labeling by restaurants can help you make informed and healthful decisions about meals away from home.

UP NEXT

Now that you are aware of where to find calories on menus and menu boards in restaurants, let’s take a look at vending machines and between-meal snacks. ▶▶▶

STUDENT WORKSHEET

TWO MEALS ON THE GO! A HEALTHIER OPTION

Name _____ Date _____ Class/Hour _____

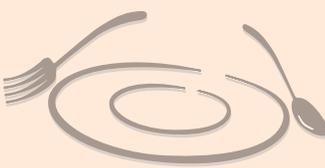
Meal 2: Name of Restaurant _____

Circle one:

breakfast

lunch

dinner

 Food Name	Total calories	Saturated Fat (g)	Trans fat (g)	Sodium (mg)	Total Carbohydrates (g)	Dietary Fiber (g)	Sugars (g)	Protein (g)
Total								

- If you ate these meals, how many more calories should you eat for the rest of the day (based on your daily calculated calorie needs)? _____
- How many of the calories in these meals are from saturated fat? _____
- Considering the personal daily calorie needs you calculated, what is the limit for how many of your calories a day should come from saturated fat? _____
- If you ate these meals, how much more saturated fat can you eat the same day? _____
- How much of your daily sodium would you consume if you ate these two meals in one day? _____
- Based on the data you collected, do you think these are healthy meals? Justify your response. _____

- What (if any) substitutions could you make to make your meals healthier? _____



PART 2

Vending Machines

Sometimes when you are hungry or skip a meal, you might look for something quick, easy, and convenient. Vending machine snacks may be the answer, but are they good for us? More than one fourth of a teenager's daily calories come from snacks. It's important that those snacks are healthy.

Calorie information is required for vending machine operators who own or operate 20 or more vending machines, but vending machine operators not covered by the requirements can voluntarily register to be covered. Unless calories are already visible on the actual snack package before purchase, the labeling may be shown on a:

- Sign
- Sticker
- Poster
- Small placard
- Electronic or digital display near the food item or selection button

The calories must be declared for the entire item as vended (not per serving). This includes vending machines that sell:

- Soft drinks
- Packaged snacks
- Hot-and-cold cup beverages
- Refrigerated prepared food (such as those sold from turnstile vending machines)
- Handfuls of nuts or candies (such as those sold from bulk vending machines)

Game machines (such as claw machines in arcades) are not covered, even if they sometimes dispense candy or other edible items as part of the game.

Smart Snacks in School

All food and beverages sold in school vending machines during the school day must meet nutrition standards. The USDA **Smart Snacks in School** regulation applies to school foods sold à la carte, in the school store, and from vending machines. To qualify as a Smart Snack, a snack must first meet the following general nutrition standards (from the regulation):

- be a grain product that contains 50 percent or more whole grains by weight (have a whole grain as the first ingredient); or
- have as the first ingredient a fruit, a vegetable, a dairy product, or a protein food; or
- be a combination food that contains at least ¼ cup of fruit and/or vegetable; and
- the food must meet the nutrient standards for calories, sodium, sugar, and fats.

Nutrient	Snack
Calories	200 calories or less
Saturated Fat	Less than 10% of calories
Trans Fat	0g
Sodium	200mg or less
Sugar	35% by weight or less

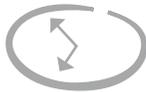
DID YOU KNOW?

Vending machine definition

A vending machine is a self-service machine that, upon insertion of a coin, paper currency, token, card, or key, or by optional manual operation, dispenses servings of food in bulk or in packages, or prepared by the machine, without the necessity of replenishing the machine between each vending operation.



✓ YOUR SNACKS!



TIME One 45-Minute Class Period



ACTIVITY AT A GLANCE

In this activity, students will compare nutrition facts from their favorite snacks with similar snacks (Smart Snacks) served in schools.

GETTING STARTED

MATERIALS

- ✓ Your Snacks Worksheet (one for each student)
- Empty snack packages

ADVANCE PREPARATION

Collect empty vending machine snack packages with the Nutrition Facts label that are sold in schools. Optional: Ask students to bring in their favorite empty snack packages similar to those sold in school vending machines. Snacks may include:

- Candies
- Candy bars
- Corn chips
- Crackers
- Potato chips
- Pretzels
- Cookies
- Popcorn
- Other snacks

TEACHER NOTE

If your school does not have vending machines, collect packages from snacks that also have healthier versions, such as regular potato chips and oven-baked chips.

INTRODUCTION

Begin the activity by asking the following questions:

1. *What are some of your favorite snacks?*
2. *Are they healthy? How do you know how healthy your snack is?*
3. *Have you read the nutrition information for the snacks?*
4. *Do you eat the snacks that are provided in school vending machines?*
5. *Why should you follow a healthy eating pattern?*



TIME TO TUNE IN

USDA Guide to Smart Snacks in Schools
www.fns.usda.gov/tn/guide-smart-snacks-schools

Teachers can use printed copies or online and discuss the slides' key points with the students.



PROCEDURE

1. Prior to this class, ask your students to collect empty packages of their favorite snack foods and bring them to class.
2. Using sample packages, discuss how some snacks have more than one serving.
3. Distribute a worksheet to each student and at least two empty packages of snacks that are sold in vending machines to each group of students. If your school has vending machines for students, use wrappers from items that are sold in those vending machines.
4. Instruct the students to complete the information for their snack in the left column and the information from the school snack on the right column.
5. Remind them that school snacks must meet federal requirements.
6. Students should place a ✓ if the snack meets the criteria as a Smart Snack and X if it does not.
7. Ask for volunteers to share their information.
8. Discuss the importance of healthy snacking.

REVIEW

Ask students:

Where will you find calorie information that is required for vending machine operators who own or operate 20 or more vending machines? (The calories will be shown on a sign [such as on a small placard, sticker, or poster] or on electronic or digital displays near the food item or selection button and the calories must be declared for the entire item as vended [not per serving]. Calories may also appear on the food package itself, for example, by showing the Nutrition Facts label or a declaration on the front of package before the item is vended.)

What makes a snack a “Smart Snack” in schools?

(To qualify as a Smart Snack, a snack must first meet the following general nutrition standards [from the regulation]:

- Be a grain product that contains 50 percent or more whole grains by weight [have a whole grain as the first ingredient]; or

- Have as the first ingredient a fruit, a vegetable, a dairy product, or a protein food; or
- Be a combination food that contains at least ¼ cup of fruit and/or vegetable; and
- The food must meet the nutrient standards for calories, sodium, sugar, and fats.)

<i>Nutrient</i>	<i>Snack</i>
Calories	200 calories or less
Saturated Fat	Less than 10% of calories
<i>Trans</i> Fat	0g
Sodium	200mg or less
Sugar	35% by weight or less



✓ YOUR SNACKS!

EXTENSIONS

1. Display images of vending machines. Discuss with students the snacks that may be in a machine. Encourage students to do a web search on various snacks to calculate the saturated fat calories.
2. If your school has vending machines, have students critique what is offered and make additional healthy suggestions.
3. Students could use the Product Calculator to determine if their snack is a Smart Snack - www.healthiergeneration.org/take_action/schools/snacks_and_beverages/smart_snacks/alliance_product_calculator/
4. Invite your school district's Director of Food and Nutrition Services to talk with your class about the school lunch program and vending machine selections.

SUMMARY

Calorie labeling on vending machines can help you make informed and healthful decisions about snacks.

RESOURCES

- FDA Food Fact: Calorie Labeling on Restaurant Menus and Vending Machines: What You Need To Know www.fda.gov/Food/LabelingNutrition/ucm436722.htm
- Healthy Eating on the Go www.nhlbi.nih.gov/health/educational/wecan/downloads/matte25.pdf
- Nutrition and Healthy Eating – Tracking How Much Fat You Eat www.mayoclinic.org/healthy-lifestyle/nutrition-and-healthy-eating/expert-answers/fat-grams/faq-20058496?p=1
- Portion Distortion www.nhlbi.nih.gov/health/educational/wecan/eat-right/portion-distortion.htm
- USDA's Smart Snacks in School Regulation Resources <https://healthymeals.fns.usda.gov/smartsnacks>
- Kids Health: Eating Well While Eating Out <http://kidshealth.org/en/teens/eating-out.html?WT.ac=ctg#catnutrition>
- *Dietary Guidelines for Americans 2015-2020* <https://health.gov/dietaryguidelines/2015/guidelines>

STUDENT WORKSHEET

✓ YOUR SNACKS!

Name _____ Date _____ Class/Hour _____

Everyone likes to snack but is your snack healthy for you? Let's find out.

Compare two of your favorite snacks with two school snacks for optimal nutrition. Place a ✓ if it meets the criteria as a Smart Snack and X if it does not.

List the criteria for a snack to be a Smart Snack:

Nutrient	Snack
Calories	
Saturated Fat	
<i>Trans</i> Fat	
Sodium	
Sugar	

Your Snack	✓ or X		✓ or X	School Snack
		Name of Snack		
		Serving Size		
		Calories		
		Saturated Fat		
		<i>Trans</i> Fat		
		Sodium		
		Sugar		

Your Snack	✓ or X		✓ or X	School Snack
		Name of Snack		
		Serving Size		
		Calories		
		Saturated Fat		
		<i>Trans</i> Fat		
		Sodium		
		Sugar		

1. Did your snack meet the criteria for a Smart Snack? _____
2. How do you know? _____
3. How will this make you rethink your snack choices? _____
4. Explain how likely you are to choose a Smart Snack instead of another snack in a grocery store. _____

STUDENT REVIEW WORKSHEET

SUGAR IN BEVERAGES

Name _____ Date _____ Class/Hour _____

How much energy (calories) do carbohydrates supply? _____

What are the different kinds of carbohydrates? _____

Which carbohydrates are more nutrient-dense? _____

What is the daily value for all carbohydrates based on a 2,000-calorie diet? _____

How does the sugar in beverages affect your body and overall health? _____

What are some ways to reduce sugar intake? _____

STUDENT REVIEW WORKSHEET

SODIUM IN SNACK FOODS

Name _____ Date _____ Class/Hour _____

What is the recommended daily limit for sodium? _____

Where does most of the sodium in our diet come from? _____

What foods are higher in sodium, and what foods have less sodium? _____

What are some ways to reduce sodium intake? _____

STUDENT REVIEW WORKSHEET

MEAL PLANNING

Name _____ Date _____ Class/Hour _____

Where on the Nutrition Facts label can you find serving size and servings per container? _____

Why are these important to know? _____

How can you find how much energy you can get from a food? _____

Why is it important to know the amount of energy you get from a food? _____

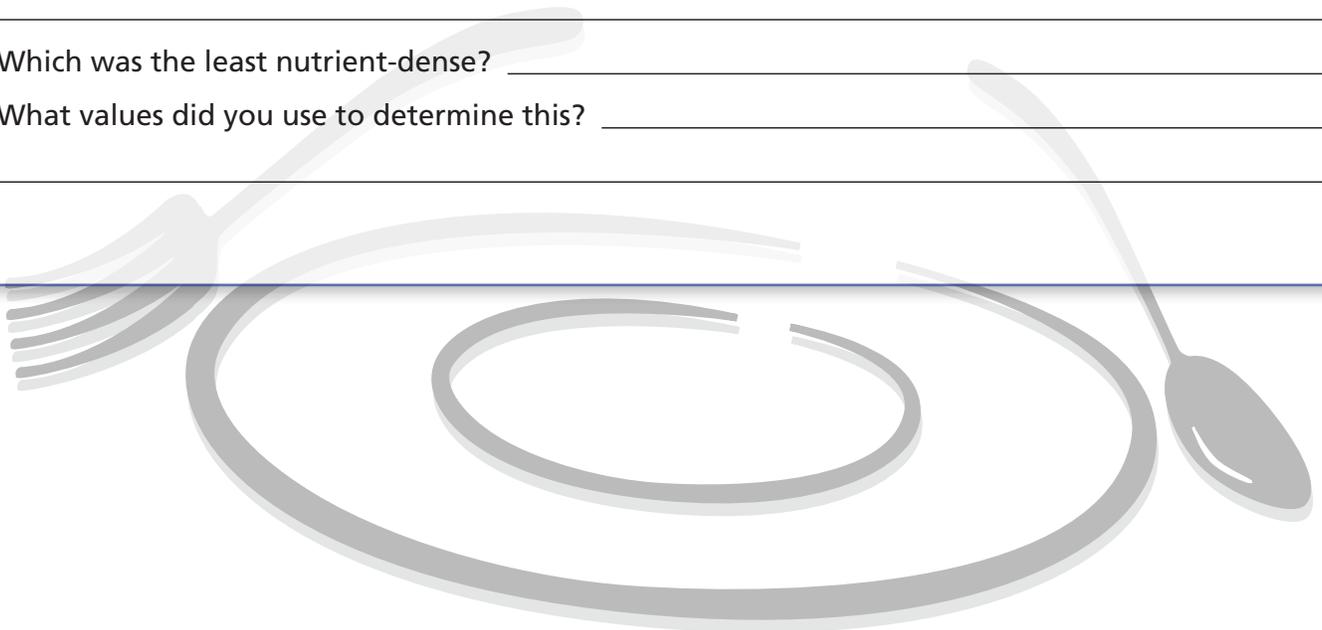
How do you use %DV to determine which nutrients in the food are low and which are high? _____

What are nutrient-dense foods? _____

Which of the breakfast foods reported was the most nutrient-dense food? _____

Which was the least nutrient-dense? _____

What values did you use to determine this? _____



STUDENT REVIEW WORKSHEET

INTERACTIVE LABEL RESEARCH

Name _____ Date _____ Class/Hour _____

What is the importance of fat in your diet? _____

How is the amount of energy that you get from fats different from the amount of energy that you get from proteins and carbohydrates? _____

What have you learned about the different kinds of fat – saturated, *trans*, monounsaturated, and polyunsaturated? _____

Which of your favorite foods contained fat? How much was saturated or *trans* fat? How did you determine this? _____

Why is it important to know what kinds of fats are found in a particular food, and in what amounts? _____

Explain the differences in carbon bonds in saturated fat, monounsaturated fat, and polyunsaturated fat. _____

At the beginning of the Interactive Label Research activity, you were asked if you thought most Americans consumed too much fat. Based on what you have learned about fats in this lesson, what is your opinion now of this statement? Be sure to explain the reasons for your opinion. _____

STUDENT REVIEW WORKSHEET

SATURATED AND UNSATURATED FAT MODELING

Name _____ Date _____ Class/Hour _____

What determines if a fat is solid or liquid at room temperature? _____

If a fat cannot be directly observed in a particular food, how can you determine if the food contains fat? _____

If a food contains fat, how can you determine exactly what kind of fat it is? _____

How would you define "healthy fat"? _____

What are essential fatty acids, and what food products contain them? _____

What saturated and *trans* fat limits are recommended by the *Dietary Guidelines for Americans*? _____

STUDENT REVIEW WORKSHEET

TWO MEALS ON THE GO!

Name _____ Date _____ Class/Hour _____

What is meant by a healthy eating pattern? _____

What information will you be able to find on most restaurant menus that will help you make healthy decisions about the food you order? Why is this information important? _____

Which restaurants are required to meet the menu labeling requirements? _____

In restaurants where the calorie information is on the menu, what additional information should the restaurant have available for the consumer? _____

When you make fast food meal choices, which nutrients are the most important to you? _____

List at least 3 tips you would use to order a healthy meal when eating out, and explain why you would use them. _____

Why is it important to know your personal daily calorie needs, and your sodium and saturated fat limits? _____

STUDENT REVIEW WORKSHEET

✓ YOUR SNACKS

Name _____ Date _____ Class/Hour _____

What nutrient information must be shown on snacks sold in some vending machines? How would this information influence the snack you purchase from this vending machine? _____

What is a **Smart Snack**? How is this snack different from ones not sold in schools? _____

Do you think that snacks sold in schools should be healthier than those sold in the supermarket? Be sure to give the reasons for your thinking. _____

An 'anytime' snack has been defined as a snack that is nutrient dense. Which of your snacks would belong to this group? What information did you use to put the snack(s) in this group? _____

A 'sometimes' snack has been defined as a snack high in empty calories, solid fats, added sugars, or sodium and are foods that should be limited. Which of your snacks would belong to this group? What information did you use to put the snack(s) in this group? _____

GLOSSARY

For the purposes of these materials, these terms are defined as follows.

Added Sugars includes sugars that are either added during the processing of foods, or are packaged as such (e.g., a bag of table sugar), and include sugars from syrups and honey, and sugars from concentrated fruit or vegetable juices.

Calories refer to the “energy” supplied from all food sources (fat, carbohydrate, protein, and alcohol).

Cholesterol is a waxy, fat-like substance produced primarily by the liver in both humans and animals. It is found in all cells of the body. Cholesterol in food is referred to as “dietary cholesterol” and is found only in animal products.

Dietary Fiber, or fiber, is sometimes referred to as “roughage.” It is a type of carbohydrate made up of many sugar molecules linked together. But unlike other carbohydrates (such as starch), dietary fiber is bound together in such a way that it cannot be readily digested in the small intestine.

An **Essential Nutrient** is a vitamin, mineral, fatty acid, or amino acid required for normal body functioning that either cannot be synthesized by the body at all or in amounts adequate for good health, and thus must be obtained from a dietary source. Some food components that are not essential, such as dietary fiber, are still considered to be important nutrients.

A **Healthy Eating Pattern** is the combination of foods eaten over time – at an appropriate calorie level – that provide variety and give you the nutrients you need to maintain your health, feel good, and have energy. These nutrients include protein, carbohydrates, fat, vitamins, minerals, and water.

The **Ingredient List** shows each ingredient in a food by its common or usual name in descending order by weight.

A **Lipid** is an organic compound that is oily to the touch and insoluble in water. Lipids include fats, oils, and waxes and are a source of stored energy. The terms lipid and fat are often used interchangeably.

Minerals are inorganic substances that are not made by living things, but they are important for human growth, development, and normal body functioning. Minerals are naturally found in soil and water and are absorbed by plants, which are then eaten by people and other animals. Examples of minerals are iron, calcium, and potassium. People obtain minerals from both the plant and animal products they eat.

Monounsaturated Fatty Acids (MUFAs) are fats that have one double bond between the carbon atoms and are usually liquid at room temperature. Plant sources rich in monounsaturated fats include vegetable oils (such as canola and olive oil), avocados, peanut butter, and most nuts.

Nutrient Dense foods and beverages contain vitamins, minerals, dietary fiber, and other substances that may have positive health effects, while contributing relatively few calories. Examples include fruits, vegetables, whole grains, seafood, beans and peas, unsalted nuts and seeds, fat-free and low-fat milk and milk products, and lean meats and poultry.

Nutrients are substances in food that contribute to growth and health. Nutrients provide energy, cell-building and structural materials, and agents that regulate body chemistry.

%DV stands for **Percent Daily Value**, which is found on the Nutrition Facts label. It is a guide to how much a nutrient in a serving of the food contributes to a daily diet. For example, if the label lists 15% DV for calcium, it means that one serving of the food provides 15% of the calcium you need each day.

Polyunsaturated Fatty Acids (PUFAs) are fats that have two or more double bonds between the carbon atoms and are usually liquid at room temperature. Primary sources of this fat are vegetable oils; fatty fish such as salmon, mackerel and sardines; and some nuts and seeds. Polyunsaturated fats provide essential fats.

Saturated Fat is found in higher proportions in animal products and is typically solid at room temperature. The exceptions are seafood (which is low in saturated fat) and certain tropical plant oils, such as coconut oil, palm oil, and palm kernel oil (which are high in saturated fat).

Saturated Fatty Acids are fats that have no double bonds between the carbon atoms. They are called “saturated” because all the spaces on the fat molecule that can hold a hydrogen atom do so and are “full” – that is, the molecule is “saturated” with hydrogen atoms. Saturated fats are usually solid at room temperature. Major sources include butter and beef fats, and tropical oils such as coconut or palm oils. The human body makes all the saturated fat that it needs, so it is unnecessary to consume additional saturated fat.

Serving Size is based on the amount of food that is customarily eaten at one time. All of the nutrition information listed on a food’s Nutrition Facts label is based on one serving of that food.

Servings per Container indicates the total number of servings in the entire food package or container.

A **Triglyceride** is a compound formed from a glycerol and three fatty acid groups. Triglycerides are the main constituents of natural fats and oils.

Trans Fat is an unsaturated fat, but it is structurally different than unsaturated fat that occurs naturally in plant foods. *Trans* fat has detrimental health effects and is not essential in the diet. Most *trans* fat is man-made (designed to improve texture and help food last longer).

Vitamins are organic substances made by plants and animals, which are then eaten by humans. There are 13 vitamins: vitamins A, C, D, E, K, and the B vitamins (thiamin, riboflavin, niacin, pantothenic acid, biotin, vitamin B6, vitamin B12, and folate). You can get all your vitamins from the foods you eat, but your body also makes vitamins D and K.

Whole Grains include the entire grain seed (usually called the “kernel”), which consists of the bran, germ, and endosperm — nothing has been added or taken away by processing. Whole grains are consumed either as a single food (such as wild rice or popcorn) or as an ingredient in food, such as in cereals, breads, or crackers.

RESOURCES

(references, classroom materials, partner websites, etc.)

Online Resources for Teachers

FDA's Nutrition Facts Label Programs & Materials

www.fda.gov/nutritioneducation

NSTA e-Learning Center

www.learningcenter.nsta.org

In-depth nutrition tutorials (Science Objects) for teachers.

Nutrition Voyage: Conducting a School Survey

www.fns.usda.gov/sites/default/files/nutvoyage7_trek2.pdf

Students examine the food and beverage choices of their school community.

Healthier US School Challenge: Smarter Lunchrooms

www.fns.usda.gov/hussc/healthierus-school-challenge-smarter-lunchrooms

Food Tracker

www.supertracker.usda.gov/foodtracker.aspx

An online tracker that helps you monitor your daily caloric intake, record your physical activity, and set targets for eating foods from all food groups.

Talking About *Trans* Fat – What You Need to Know

www.fda.gov/downloads/Food/Resourcesforyou/consumers/ucm079646.pdf

Carbonated Soft Drinks: What You Should Know

www.fda.gov/Food/IngredientsPackagingLabeling/FoodAdditivesIngredients/ucm232528.htm

Medicines in My Home: Caffeine and Your Body (FDA/CDER)

www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm200805.pdf

Science and Our Food Supply

www.fda.gov/teachsciencewithfood

Additional Reading

Dietary Guidelines for Americans 2015 – 2020

<https://health.gov/dietaryguidelines/2015/>

Office of the Surgeon General. *The Surgeon General's Vision for a Healthy and Fit Nation* Rockville, MD, U.S. Department of Health and Human Services; 2010.

www.ncbi.nlm.nih.gov/books/NBK44660/

SCIENCE AND OUR FOOD SUPPLY

Using the **Nutrition Facts Label**
to Make Healthy Food Choices

Education Standards by Activity								
	Serving Size and Calories	Sugar in Beverages	Sodium in Snack Foods	Meal Planning	Get the Facts about Fat	Saturated and Unsaturated Fat Modeling	Two Meals on the Go	✓ Your Snacks
NGSS – Physical Science: Structures and Properties of Matter			✓		✓	✓		
NGSS – Physical Science: Chemical Reactions			✓		✓	✓		
NGSS – Life Science: Matter and Energy in Organisms and Ecosystems	✓	✓	✓	✓	✓	✓	✓	✓
NGSS – Engineering Design				✓			✓	
NSFCSE: Food Science, Dietetics, and Nutrition	✓	✓	✓	✓	✓	✓	✓	✓
NSFCSE: Nutrition and Wellness	✓	✓	✓		✓	✓	✓	✓
National Health Education Standards (1)	✓	✓	✓	✓	✓	✓	✓	✓
National Health Education Standards (2)		✓					✓	✓
National Health Education Standards (3)	✓	✓	✓	✓	✓	✓	✓	✓
National Health Education Standards (4)				✓			✓	✓
National Health Education Standards (5)				✓			✓	✓
National Health Education Standards (6)				✓			✓	✓
National Health Education Standards (7)				✓			✓	✓
Common Core, ELA/Literacy	✓	✓	✓	✓	✓	✓	✓	✓
Common Core, Math	✓	✓	✓	✓	✓	✓	✓	✓

See next pages for full standards: NGSS, NSFCSE, National Health Education Standards, and Common Core Math and ELA/Literacy ▶

NGSS – Next Generation Science Standards Arranged by Topics

Structure and Properties of Matter

- HS-PS1-1 Use the periodic table as a model to predict the relative properties of elements based on the pattern of electrons in the outermost energy level of atoms.
- HS-PS2-6 Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.

Chemical Reactions

- HS-PS1-2 Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

Matter and Energy in Organisms and Ecosystems

- HS-LS1-6 Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
- HS-LS1-7 Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in the new compounds are formed, resulting in a net transfer of energy.

Engineering Design:

- HS-ETS1-2 Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

NSFCSE – National Standards for Family and Consumer Science Education

Food Science, Dietetics, and Nutrition Competencies

- 9.3.1 Analyze nutrient requirements across the life span addressing the diversity of people, culture, and religions.
- 9.3.2 Analyze nutritional data.
- 9.3.6 Critique the selection of foods to promote a healthy lifestyle.
- 9.4.1 Analyze nutritional needs of individuals.
- 9.7.1 Explain the properties of elements, compounds, and mixtures in foods and food products.
- 9.7.4 Explain the impact of molecular structure of simple and complex carbohydrates on digestion, nutrition, and food preparation procedures.
- 9.7.5 Relate the composition of lipids and proteins to their functions in foods and their impact on food preparation and nutrition

Nutrition and Wellness Competencies:

- 14.2.1 Analyze the effect of nutrients on health, appearance, and peak performance.
- 14.2.2 Analyze the relationship of nutrition and wellness to individual and family health throughout the life span.
- 14.2.4 Analyze sources of food and nutrition information, including food labels, related to health and wellness.
- 14.3.1 Apply various dietary guidelines in planning to meet nutrition and wellness needs.

National Health Education Standards (CDC/American Cancer Society)

- (1) Comprehend concepts related to health promotion and disease prevention to enhance health.
- (2) Analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.
- (3) Demonstrate the ability to access valid information and products and services to enhance health.
- (4) Demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.
- (5) Demonstrate the ability to use decision-making skills to enhance health.
- (6) Demonstrate the ability to use goal-setting skills to enhance health.
- (7) Demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risk.

CONTINUED ► ► ►

Common Core, ELA/Literacy

- W.11-12.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient information.
- W.11-12.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to the task, purpose, and audience.
- SL.11-12.1 Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
- L.11-12.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- L.11-12.6 Acquire and use accurately general academic and domain-specific words and phrases sufficient for reading, writing, speaking and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
- RH.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.
- RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
- RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.

Common Core, Math

- N-Q Reason quantitatively and use units to solve problems.

**Science and Our Food Supply:
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was brought to you by ...**



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