

## LESSON 7



# Sugar Water: Think About Your Drink

## Background

Sugary drinks such as soda, fruit punch, energy drinks, sweetened iced teas, and sports drinks are a major source of sugar in the American diet—and children consume a lot of them. Studies have even found that children are starting to consume sugary drinks in infancy. By adolescence, the average teen consumes about 24 ounces (710 ml) of sugary drinks each day.

The steady climb in children's intake of sugary drinks is troubling for many reasons. Sugary drinks are filled with empty calories because they basically contain just sugar and water, and they provide many calories but few of the nutrients the body needs to stay healthy and grow strong. A growing body of research strongly suggests that consumption of sugary drinks is associated with unhealthy weight gain in children and adults.

One study found that middle school students who increased their consumption of sugary drinks gained unhealthy weight; for each additional 12-ounce (355 ml) serving of sugary drink consumed per day, the odds of becoming obese increased by 60%. Reducing or avoiding empty calories from sugary drinks may help with weight control: Another study found that when overweight teenagers reduced their consumption of sugary drinks by replacing those beverages with calorie-free options such as water, they reduced their unhealthy weight. Other research connects the consumption of sugary drinks with an increased risk for type 2 diabetes.

Additionally, as children's soda consumption has increased, their milk consumption has decreased. That is a worrisome trend, given that adolescence is a time of rapid bone development. Children and teenagers who do not maximize bone development during these crucial years (by consuming enough calcium-rich foods and getting regular physical activity) may increase their risk of osteoporosis in late adulthood.

A healthy eating plan does not include beverages with added sugar. Children should also avoid consuming artificially sweetened beverages, because the long-term effects of artificial sweetener consumption are unknown, and drinking them may encourage a taste for sweetness. Water should be children's main drink of choice, because it quenches thirst and keeps them hydrated (for more on water, see lesson 8).<sup>\*</sup> Other healthy beverages include unflavored milk for calcium; calcium-fortified nondairy drinks,<sup>\*\*</sup> and 100% fruit juice. However, consumption of 100% fruit juice should be limited to no more than 4 to 6 ounces (120-170 ml) per day. Juice contains vitamins and minerals, but it naturally contains a large amount of fruit sugar (fructose) and lacks the fiber found in fresh whole fruit. To make it easier to stay within the fruit juice limit, dilute a small amount of 100% fruit juice (2 to 3 oz, or 60 to 90 ml) with sparkling water.

*\*During most types of physical activity, children can get adequate hydration and energy by drinking water and having a healthy snack of whole fruit (such as orange slices). Most sports drinks are designed for endurance athletes who compete for more than an hour at high intensity. Save sports drinks for when children are participating in high-intensity, long-duration sports competitions (longer than one hour) or for when children are vigorously active for a long time in the heat.*

*\*\*Choose plain soy, almond, rice, or other unflavored and unsweetened nondairy drinks.*

## Estimated Teaching Time and Related Subject Areas

**Estimated teaching time:** 1 hour, 15 minutes

**Related subject areas:** math, health, language arts (vocabulary)

## Objectives

- Measure the amount of sugar consumed from soda and evaluate the results.
- Identify the forms of sugar added to beverages.

- Demonstrate how the body responds to sugary drinks.
- Learn to replace soda and other sugary drinks with healthy drinks such as water.

## Materials

- Sugar (5 lb, or 2 kg, bag)
- Measuring teaspoons
- Small paper cups or clear plastic cups
- Worksheet 7.1, Soda Count
- Worksheet 7.2, Find the Sugar
- Drink labels that students have brought in from home (optional)
- Worksheet 7.2 Solutions

**Worksheet 7.1**

### Soda Count

Name \_\_\_\_\_

**Part I: What's Your Soda Count?**

Fill in the Soda Count table (table 7.1) with the number of 12-ounce (355 ml) cans and 20-ounce (590 ml) bottles of soda you drank yesterday.

You may need to estimate the amounts you drank and round to a whole number. For instance, if you opened a 20-ounce (590 ml) bottle but drank only half of it, you consumed approximately one 12-ounce (355 ml) can of soda.

	12 oz (355 ml) can of soda (10 top of sugar)	20 oz (590 ml) bottle of soda (17 top of sugar)
How many did you drink yesterday?		

Calculate the total teaspoons of sugar you consumed from soda.

- How many teaspoons of sugar did you consume from 12-ounce (355 ml) cans of soda? \_\_\_\_\_. For example, if you drank 2 cans, then 2 cans  $\times$  10 teaspoons = 20 teaspoons of sugar.
- How many teaspoons of sugar did you consume from 20-ounce (590 ml) bottles of soda? \_\_\_\_\_. For example, if you drank 2 bottles, then 2 bottles  $\times$  17 teaspoons = 34 teaspoons of sugar.
- Add the results (sugar from soda in a can and sugar from soda in a plastic bottle) to determine the total teaspoons of sugar you consumed yesterday from soda (add the answers from question 1 and question 2): \_\_\_\_\_

**Part II: How Much Sugar Is This?**

Using the sugar provided, measure out the amount of sugar you consumed yesterday. How would you describe the amount of sugar?

From L.W.Y. Cheung, H. Dai, S. Kato, B. Ohi, and L.L. Gortmaker, 2016, Eat Well & Sleep Strong, 3rd ed. ©Thomson, B. Pearson Education.

**Worksheet 7.2**

### Find the Sugar

Name \_\_\_\_\_

**Part I: Word Find**

Find each of the words for sugars and artificial sweeteners in the puzzle. Words may appear forward, backward, diagonally, horizontally, or vertically.

Y E P L W T P M H A M N R Z K F A Q L  
E S X V O O I U A X I O L V E S S R F  
E O S K T I P B R A W I L O W U U U  
S T U H K P W J T Y X V Y A G R C H F  
O L C R J R X X B E S T Y A S T P R B  
R A R T O C E G K S A N R D F S U P V  
T M O K J D F B Q O A I R A T C E K Q  
X J S X O P E I X L S V C O T E I S F  
E D E T P S M N A A P M A O C Z Y M T  
O O L F O D T Z W R A O S Q P R R P N  
K A S C E C D Q J C R E A G Z T H E  
M E U R L T G F O U T M W K K H D M S  
J L N B S M I X R S A S B M C N O Z A W  
G O S D U X M P M D M L J B X E P O U  
S K W B J T M N F D E F H O N E Y E E  
S V O P L T P I Z H V Q L O P J G V Q

aspartame dextrose glucose maltodextrin molasses sucrose  
corn syrup fructose honey maltose saccharose sugar

**Part II: What's in Your Drink?**

Circle the words for sugar and any artificial sweeteners in the ingredients lists that follow. Which drink has the most types of added sugar? Next, circle the grams of sugar in each food label. Which drink has the most grams of sugar? Note which drinks are sold in bottles that contain more than one serving.

From L.W.Y. Cheung, H. Dai, S. Kato, B. Ohi, and L.L. Gortmaker, 2016, Eat Well & Sleep Strong, 3rd ed. ©Thomson, B. Pearson Education.

**Worksheet 7.2 Solutions**

### Find the Sugar

**Part I: Word Find**

Find each of the words for sugars and artificial sweeteners in the puzzle. Words may appear forward, backward, diagonally, horizontally, or vertically.

Y E P L W T P M H A M N R Z K F A Q L  
E S X V O O I U A X I O L V E S S R F  
E O S K T I P B R A W I L O W U U U  
S T U H K P W J T Y X V Y A G R C H F  
O L C R J R X X B E S T Y A S T P R B  
R A R T O C E G K S A N R D F S U P V  
T M O K J D F B Q O A I R A T C E K Q  
X J S X O P E I X L S V C O T E I S F  
E D E T P S M N A A P M A O C Z Y M T  
O O L F O D T Z W R A O S Q P R R P N  
K A S C E C D Q J C R E A G Z T H E  
M E U R L T G F O U T M W K K H D M S  
J L N B S M I X R S A S B M C N O Z A W  
G O S D U X M P M D M L J B X E P O U  
S K W B J T M N F D E F H O N E Y E E  
S V O P L T P I Z H V Q L O P J G V Q

aspartame dextrose glucose maltodextrin molasses sucrose  
corn syrup fructose honey maltose saccharose sugar

**Part II: What's in Your Drink?**

Circle the words for sugar and any artificial sweeteners in the ingredients lists that follow. Which drink has the most types of added sugar? Next, circle the grams of sugar in each food label. Which drink has the most grams of sugar?

From L.W.Y. Cheung, H. Dai, S. Kato, B. Ohi, and L.L. Gortmaker, 2016, Eat Well & Sleep Strong, 3rd ed. ©Thomson, B. Pearson Education.

Lesson 7—Sugar Water: Think About Your Drink 1

## Procedure

### Part I: Evaluate Sugar Intake

*You may need to assist students in estimating the amount of soda they consumed if they consumed something other than a can or bottle. This exercise is not meant to be an exact record but rather a rough estimate of the amount of sugar consumed from soda or other sugary drinks.*

*Students who did not drink soda the previous day may fill out the sheet based on what they drink on a typical day; if several students did not drink soda the previous day or some students rarely drink it because of household rules, it may be more effective to conduct this activity in groups.*

1. Introduce the lesson by asking students to say what they think about the word *sugar*. Ask them to list the foods and drinks that they consume that contain sugar. What is the most common food or beverage listed?
2. Explain that sugary drinks, such as soda, represent a major source of sugar intake in the diets of older children and teenagers. Distribute Worksheet 7.1 (Soda Count) to students, and instruct them to complete the Soda Count table by recording the number of 12-ounce (355 ml) cans and 20-ounce (590 ml) bottles of soda (or other sugary drink) they consumed the previous day. Then have them calculate the total number of teaspoons of sugar consumed from all the drinks.
3. Have students evaluate their sugar intake (part II of Worksheet 7.1). Distribute the paper cups. Instruct the students to measure out a teaspoon of sugar for each teaspoon of sugar they consumed from soda the previous day and to pour the sugar into their cups to visualize the amount of sugar consumed. Alternatively, to minimize the amount of sugar used for this activity, choose a few students to measure out their sugar intake and demonstrate it to the class.  
Discuss the students' observations—were they surprised at the amount of sugar they consumed?
4. Discuss beverages that provide students with a health benefit, such as water, unflavored milk, and 100% fruit juice (in moderation).

### SUGAR IN DRINKS

There are 24 teaspoons in  $\frac{1}{2}$  cup.

- A child who consumes just one can of soda per day (10 teaspoons of sugar) may consume 70 teaspoons of sugar over one week, which translates to about 3 pounds (1.4 kg) of sugar each month (using the simple calculation of four weeks in a month) and 36 pounds (16 kg) of sugar each year.
- To demonstrate what 3 pounds (1.4 kg) feels like, pass around the bag of sugar. Although not exact (your bag of sugar will be close to 5 lb, or about 2 kg), it will give students an idea of the volume and weight of sugar consumed via sugary drinks. Remind students that, like soda and other sugary drinks, the bag is full of sugar but has no other nutrients. There are no vitamins or minerals in sugar—just empty calories (meaning energy without any other benefits for the body).
- Remind students that soda is not the only beverage that contains added sugars. Review the list created by the students at the start of this lesson, and point out the other drinks that contain large amounts of added sugar (e.g., sports drinks, energy drinks, fruit punches, lemonade, sweetened iced teas).

## Part II: Identify Sugar in Drinks

1. Distribute Worksheet 7.2, Find the Sugar, so that students may identify other words for sugar (in part I of Worksheet 7.2). Next, have students find some of these words in the drink ingredients lists provided in part II of Worksheet 7.2. Explain that many drinks that sound healthy actually contain a lot of added sugar (ask students to name some fruit drinks or energy drinks they like, because many fruit drinks and energy drinks have a lot of added sugar; see Worksheet 7.2 for an example). This sugar is often hidden because the ingredients lists on food labels use other names for sugar.
  - a. For an optional math extension, review the nutrition facts labels from Worksheet 7.2 and ask the students, “Where does the label list the amount of sugar?” Explain how to convert grams of sugar to teaspoons of sugar (1 teaspoon = 4 grams).
  - b. Calculate the teaspoons of sugar in popular drinks either by using the nutrition facts labels provided or by asking students to bring in labels from drinks they have at home.
2. Remind students of the healthy living goal to drink water and limit sugary drinks. Soda and other sugary drinks (e.g., sports drinks, energy drinks, fruit punches, lemonade, sweetened iced teas) contain high amounts of sugar and usually nothing else that is good for us—they basically contain just sugar and water. That’s why we say that sugary drinks give us empty calories.

*In addition to containing large amounts of sugar, energy drinks often contain caffeine, herbs, and other additives that may not be healthy for children.*

## Part III: Application and Extension of Information

1. Ask students to describe why we might want or need sugar. Explain that sugar provides the body with a quick source of energy that tastes good. The problem with consuming sugary drinks or snacks is that the energy boost from these sources does not last.
2. Have the class stand up and do the wave (raising and lowering their arms, as you might do at a sporting event). Explain that this is what happens in our bodies when we drink a whole can of soda or other sugary drink all at once (or eat sugary foods, such as a pack of jelly beans): There is a quick rise in blood sugar, giving us energy, but our bodies work quickly to pull that sugar out of the blood and into storage (in our muscles). That is why the quick boost of energy we feel after drinking a sugary drink does not last. (Adapted by permission, from J. Carter et al., 2007, *Planet Health*, 2nd ed. [Champaign, IL: Human Kinetics].)
3. Discuss better ways to get quick energy that lasts for a long time so that the body’s energy levels do not shoot up and down. Healthy carbohydrate in whole-grain foods, fruits, and vegetables provides a longer boost because the sugar and starch in the foods take longer to be digested and enter the bloodstream. These foods also provide fiber and many vitamins and minerals. Tell student that to sustain energy levels, they should choose snacks that combine healthy sources of carbohydrate (e.g., whole grains, fruits, and vegetables) with healthy sources of protein (e.g., nuts, hummus, and unflavored and unsweetened dairy products such as cheese and plain yogurt). (For more information on choosing healthy carbohydrate, see lesson 2, Carb Smart.)
4. If time allows, invite students to create a list of healthy drink options and discuss the best choices based on their health benefits. For example, the students might list the following:
  - Plain or sparkling water (alleviates thirst and promotes hydration)
  - Unflavored milk (provides calcium for strong bones and teeth)
  - 100% fruit juice (offers vitamins and minerals; note that consumption of 100% fruit juice should be limited to no more than 4-6 oz, or 120-170 ml, per day)

## Extension Activities

---

1. Ask students to calculate how much sugar they would consume from soda in a year if they continued to drink as much as they drank yesterday. (Multiply answer 3 from Worksheet 7.1 by 365.)
2. Discuss the advertisements students see on television, in print, or online for sugary drinks. Ask them to pick one ad that is familiar and discuss what they think about it. Have them describe the ad, the actors in the ad (e.g., are the children happy or athletic?), and the way the ad makes them feel about the product. (You may want to use Worksheet 19.2, *What's Up With This Ad?*, in lesson 19 for this activity.) For more information about assessing advertisements and the media, visit the Center for Media Literacy, an organization that provides resources for educators, at [www.medialit.org](http://www.medialit.org).
3. Have students create posters that advertise healthy beverage choices and post them near the cafeteria.