

## Lesson 2: *Drink Think*

### Outcome

Kids will be able to:

- Differentiate between nutritious and non-nutritious beverages. (Std. 1.10)
- Summarize the benefits of limiting the consumption of added sugar. (Std. 1.16)
- Summarize reliable sources of information about healthy eating. (Std. 3.2)
- Describe the consequences of an unhealthy diet. (Std. 5.4)
- Describe strategies a person can use to reduce the amount of sugar consumed. (Std. 7.8)

### Materials

- Lesson 2 Worksheet
- 17 sugar cubes
- Sweetened soft drinks  
1-12 oz. can and  
1-20 oz. bottle



### Discussion Points

The USDA reports sweetened soft drinks and fruit drinks account for almost half of added sugars in the American diet USDA, Amber Waves, September 2010.

<http://www.ers.usda.gov/Amberwaves/September10/Features/TaxingCaloricBeverages.htm>

The calories from sugar are referred to as “empty calories”, meaning they do not supply vitamins, minerals or any other healthful nutrients.

Studies have shown teens may be drinking 20 or more ounces of soft drinks each day.

### Discussion Questions

1. How does an intake of 20 oz. of soft drinks/day compare to your habits and the habits of people you know?
2. How does a sugar intake of 17 tsp. day or more impact a balanced day or a balanced year?
3. What are the potential health problems?
4. Some legislators and health professionals are implementing or considering a sales tax on added sugar soft drinks. Do you think taxation is a solution to consuming too much sugar?
5. Besides taxes, what are strategies a person can use to reduced the amount of sugar consumed from soft drinks?

## Activity

1. Use sugar cubes to demonstrate the amount of sugar in 1-20 oz. bottle and 1-12 oz. can of a typical sweetened soft drink.
2. Distribute the Lesson 3 Worksheet and instruct kids to use math to make calculations that will allow them to:
  - a. Identify sugar in soft drinks.
  - b. Discover in 3 different quantities, over 1 year, the amount of sugar and calories consumed.
  - c. Compare 2 different sugar saving strategies for total sugar intake and potential impact on body weight.
3. Refer to the American Heart Association ([www.americanheart.org](http://www.americanheart.org)) and American Diabetes Association ([www.diabetes.org](http://www.diabetes.org)) websites to identify and describe information about the connection between obesity and other health risks such as heart disease and diabetes.

## Move and Learn

Remind kids a balanced day includes balancing “energy in”, from food and drinks, with “energy out”. The energy in from 1 tsp sugar = 16 calories. The “energy out” when walking about 3 mph, for a typical middle school student is about 4 calories per minute.

Ask kids:

- How many minutes of walking would it take to burn the calories in 1 teaspoon of sugar? (There are 10 tsp. of sugar in 1-12 oz. can of soda.)
- How many minutes of walking would it take to burn the calories in 10 tsp of sugar?

Demonstrate the time needed to balance the number of calories in 1 teaspoon in sugar by moving for 4 minutes.

- Walk in place—1 minute.
- Reach for the sky and down to the knees—1 minute.
- Walk in place—1 minute.
- Knee lifts—1 minute.

## Summary

Healthy balance includes choosing physical activity and less added sugar foods and beverages. The added sugar in foods and beverages provides calories without the benefits of vitamins, minerals and other healthy nutrients. For that reason, calories from sugar are called “empty” calories.

## Student Assessment

**6<sup>th</sup> Grade:** With assistance, if needed.

**7<sup>th</sup> and 8<sup>th</sup> Grades:** Independently.

## Using the Lesson 2 Worksheet, kids will be able to:

1. Compare 2 different strategies to reduce sugar intake from sweetened drinks.
2. Determine a 3rd strategy.
3. Identify more nutritious beverage choices.
4. Summarize the health risks of high sugar intake and the benefits of reduced sugar intake.

# Balance Check

## Teacher References

### Lesson 2 Worksheet Answer Key

Note: Final numbers are rounded

- 1. Calculate sugar for a 1-20 oz. bottle/day** (1-20 oz. bottle of soft drink/day = 17 tsp sugar/day)
  - $17 \text{ tsp daily} \times 365 \text{ days/year} = 6,205 \text{ teaspoons/year}$
  - $6,205 \text{ teaspoons/year} \times 16 \text{ calories/teaspoon} = 99,280 \text{ calories/year}$
  - $99,280 \text{ calories/year} \div 3,500 \text{ calories/pound} = 28.5 \text{ lbs/year}$
  - $6,205 \text{ teaspoons/year} \div 3 \text{ teaspoons/tablespoon} = 2,068 \text{ tablespoons/year}$
  - $2,068 \text{ tablespoons/year} \div 16 \text{ tablespoons/cup} = 129 \text{ cups/year}$
- 2. Calculate sugar for 1-12 oz. can soft drink/day** (1-12 oz. can soft drink/day = 10 tsp sugar/day)
  - $10 \text{ tsp daily} \times 365 \text{ days/year} = 3,650 \text{ teaspoons/year}$
  - $3,650 \text{ teaspoons/year} \times 16 \text{ calories/teaspoon} = 58,400 \text{ calories}$
  - $58,400 \text{ calories/year} \div 3,500 \text{ calories/pound} = 16.5 \text{ lbs/year}$
  - $3,650 \text{ tsp/year} \div 3 \text{ teaspoons/tablespoon} = 1,217 \text{ tablespoons/year}$
  - $1,217 \text{ tablespoons/year} \div 16 \text{ tablespoons/cup} = 76 \text{ cups/year}$

Savings: 53 cups of sugar per year
- 3. Calculate sugar for a 2-20 oz. bottles/week**
  - $2\text{-}20 \text{ oz. bottles soda/week} = 34 \text{ tsp sugar/week} \times 52 \text{ weeks/year} = 1,768 \text{ tsp sugar}$
  - $1,768 \text{ teaspoons/year} \times 16 \text{ calories/teaspoon} = 28,288 \text{ calories/year}$
  - $28,288 \text{ calories/year} \div 3,500 \text{ calories/pound} = 8 \text{ lbs/year}$
  - $1,768 \text{ tsp/year} \div 3 \text{ teaspoons/tablespoon} = 589 \text{ tablespoons/year}$
  - $589 \text{ tablespoons/year} \div 16 \text{ tablespoons/cup} = 37 \text{ cups/year}$
- 4. Compare 1-20 oz. bottle to 1-12 oz. can soft drink per day**
  - Savings:  $129 \text{ cups} - 76 \text{ cups} = 53 \text{ cups sugar}$   
 $28.5 \text{ lbs} - 16.5 \text{ lbs} = 12 \text{ lbs.}$
- 5. Compare 1-20oz bottle per day to 2 -20 oz. bottles/week**
  - Savings:  $129 \text{ cups} - 37 \text{ cups} = 92 \text{ cups sugar}$   
 $28.5 \text{ lbs} - 8 \text{ lbs} = 20.5 \text{ lbs.}$

**Options for a 3rd strategy include:** Choose water instead or drink 2- 12 oz cans instead of 2-20 oz. bottles each week.

### Identify and Describe Impact of Choices on Health

- List at least 3 health risks associated with obesity. Possible answers include:
 

Diabetes	Some Cancers
Heart Disease	Stroke
High Blood Pressure	Arthritis
- Describe at least 2 benefits of reduced sugar intake. Possible answers include:
  - When calories are replaced with foods or drinks with more nutrients, nutrition is improved.
  - A reduced sugar intake reduces the risk of overweight and obesity.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Lesson 2: Balance Check Worksheet - 1

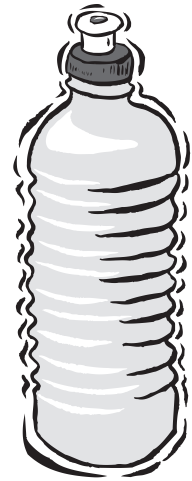
### Drink Think

#### Math Facts—What do they tell you?

Calculate and compare differences in sugar intake and calorie intake when choosing:

- 1-20 oz. bottle of soft drink/day.
- 1-12 oz. can of soft drink/day.
- 2-20 oz. bottles of soft drink/week.

Calculate the number of pounds of body weight this represents.



#### Measurement Conversions:

- 4 grams of sugar = 1 teaspoon      3 teaspoons = 1 tablespoon  
1 teaspoon sugar = 16 calories      16 tablespoons = 1 cup  
3,500 calories = 1 pound

#### The facts:

- 12 oz. soft drink = 10 tsp sugar      20 oz. soft drink = 17 tsp. sugar

#### Calculations:

- Calculate the number of teaspoons of sugar in 1- 20 oz. bottle/day.
  - Per day \_\_\_\_\_, Per year \_\_\_\_\_
  - Convert teaspoons of sugar to calories. Calories/year = \_\_\_\_\_
  - Convert calories to body weight. Body weight/year = \_\_\_\_\_
  - Convert teaspoons per year to tablespoons per year.  
Tablespoons/year = \_\_\_\_\_
  - Convert tablespoons per year to cups per year. Cups/year = \_\_\_\_\_
- Calculate the amount of sugar in a 12-oz. can/day.
  - Per day \_\_\_\_\_, Per year \_\_\_\_\_
  - Convert teaspoons of sugar to calories. Calories/year = \_\_\_\_\_
  - Convert calories to body weight. Body weight/year = \_\_\_\_\_
  - Convert teaspoons per year to tablespoons per year.  
Tablespoons/year = \_\_\_\_\_
  - Convert tablespoons per year to cups per year. Cups/year = \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Lesson 2: Balance Check Worksheet - 2

3. Calculate the amount of sugar in two 20 oz. bottles/week.
  - Per week \_\_\_\_\_
  - Per year \_\_\_\_\_
  - Convert teaspoons of sugar to calories. Calories/year = \_\_\_\_\_
  - Convert calories to body weight. Body weight/year = \_\_\_\_\_
  - Convert teaspoons per year to tablespoons per year. Tablespoons/year = \_\_\_\_\_
  - Convert tablespoons per year to cups per year. Cups/year = \_\_\_\_\_
4. Drinking a 12 oz can instead of a 20 oz. bottle is one strategy to consume less sugar. Choosing a 20 oz. bottle 2 times a week instead of every day is another strategy. Refer to your calculations and compare the two strategies.
  - Which strategy reduces sugar intake the most? \_\_\_\_\_
  - What are the savings in sugar? \_\_\_\_\_
  - What are the savings in calories? \_\_\_\_\_
  - What are the savings in pounds? \_\_\_\_\_
5. Assuming you are consuming 1-20 oz. bottle of soft drink a day, identify another way (strategy) you might use to reduce sugar intake.

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### Identify and Describe Impact of Choices on Health

Refer to the American Heart Association ([www.americanheart.org](http://www.americanheart.org)) and American Diabetes Association ([www.diabetes.org](http://www.diabetes.org)) websites.

1. List at least 3 health risks associated with obesity:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
2. Describe at least 2 benefits of consuming less sugar:
  - \_\_\_\_\_
  - \_\_\_\_\_