

# LESSON 6:

## YOU ARE WHAT YOU DRINK!

### ABOUT THE LESSON

This lesson focuses on healthy drink choices. There are three Add variations in the lesson:

- ***What's in Your Drink?*** presents a general overview of different drink options
- ***A Culture of Caffeine*** focuses on sugary, caffeinated drinks
- ***Building up Your Bone Bank with Milk*** promotes drinking milk for growth and bone health

There are also three Apply variations you can mix-and-match with any of the Add variations to create a customized lesson of your choosing.

### TEACHING MESSAGES

- |  |   |
|--|---|
| <input type="checkbox"/> Eat breakfast                     | <input checked="" type="checkbox"/> Drink water instead of sugary drinks    |
| <input type="checkbox"/> Eat different kinds of fruits     | <input checked="" type="checkbox"/> Eat foods from most MyPlate food groups |
| <input type="checkbox"/> Eat healthy snacks                | <input type="checkbox"/> Do things to be physically active                  |
| <input type="checkbox"/> Eat different kinds of vegetables |   |

### LESSON MATERIALS

#### ***All Variations***

- Access to equipment to show videos (computer, projector, etc.)
- Drink Tracker handout

#### ***Apply, Variation A***

- Beverage containers with labels removed (or brands and Nutrition Facts covered up):
 

- Energy drink	- 100% fruit juice
- Regular cola	- Bottled water
- Low fat milk	- Coffee beverage drink
- Fruit drink (not 100% juice)	- Sports drink

- Nutrition Information Cards with calories, sugar, and caffeine content
- 2-lb. bag of granulated sugar
- 1 teaspoon measuring spoon
- 8 clear or translucent plastic cups, 16 oz. size
- Pitcher
- 64 ounces of fruit-infused water (recipe: soak one 10-oz. bag of frozen berries in water for 24 hours; strain/remove fruit)
- 3-oz. drinking cups

### ***Apply, Variation B***

- Bones Graphic, printed in color on card stock
- Caffeine Crossword worksheet
- DIY Lemon-Lime Soda recipe cards, printed on card stock and cut
- Ingredients and equipment for DIY Soda recipe:
  - Pitcher (2-quart size)
  - Long-handled spoon
  - Liquid measuring cup (8 oz.)
  - Dry measuring cup (1/2 cup)
  - Cutting board
  - 2 plastic knives
  - 2 16-oz. plastic cups
  - Disposable gloves
  - Napkins or paper towels
  - Sanitizing wipes
  - Seltzer water (2 liters)
  - 3 large lemons (3 oz. juice)
  - 2 large limes (2 oz. juice)
  - Granulated sugar (1/2 cup)
  - Disposable drinking cups (3 oz. size)
  - Ice cubes

### ***Apply, Variation C***

- Quiz Team cards, printed double-sided and on card stock (or regular paper and then laminated)
- Scotch or masking tape
- Notebook or flip chart paper for scoring
- Fruit Smoothie recipe cards, printed on card stock and cut
- Ingredients and equipment for Fruit Smoothie recipe:
  - Frozen strawberries (3 cups)
  - Low fat vanilla yogurt (3 cups)
  - 3 bananas
  - Calcium fortified orange juice (3 cups)
  - Napkins or paper towels
  - Sanitizing wipes
  - Disposable drinking cups (3 oz. size)

## **LESSON PREPARATION**

### ***Anchor, All Variations***

- When you arrive, draw a quick grid on the board or flip chart paper with the following categories: Milk, 100% Juice, Water, Soda, Sports Drink, Coffee/Tea, Fruit Drink, Energy Drink.

### ***Apply, Variation A***

- Prior to the lesson:
  - Remove the labels from the beverage containers.
  - Make the fruit-infused water. Store in the refrigerator.
- Day of the lesson:
  - Set up a table with the unmarked beverage containers for the Apply activity.
  - Set aside the Nutrition Information Cards for reference later.

### ***Apply, Variation B***

- Prior to the lesson:
  - Wash the lemons and limes with a produce brush.
- Day of the lesson:
  - Set up the table for the DIY soda. Wipe down all surfaces with sanitizing wipes. Set out disposable gloves and ingredients for the soda.
  - Create stations for slicing the fruit, mixing the drink in the pitcher, and setting up the sampling cups.

### ***Apply, Variation C***

- Prior to the lesson:
  - Print the quiz cards on card stock. Cut them out into individual cards. Select ONLY the cards that have questions related to the Add variation you will be teaching (A, B, or C).
  - Prepare the smoothie recipe ahead of time following the recipe in the lesson. Store in a covered pitcher or Rubbermaid container.
- Day of the lesson:
  - Tape the quiz cards up to a board or wall.
  - Set up sampling cups and the pitcher of smoothie. (Stir if needed.)

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## **TRANSITION**

Last time we met, we talked about .... Who would like to share about...?

Today, we'll be talking about making smart choices when it comes to choosing drinks. Did you know your body is about 60% water? Being hydrated is important in order for your body to function properly. Breathing, blood circulation, eye health, bone health, digestion...everything your body does requires water. Many of us don't drink enough water. Often, we choose other drinks instead of water. While these drinks DO contain water, they also have other ingredients that aren't as healthy for us. We'll explore some of the different drink options and which ones are smarter choices.

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## ANCHOR

Let's do a quick poll. Think of the last thing you drank today. What type of drink was it? Raise your hand if the last thing you drank was:

- Any kind of milk
- 100% fruit juice
- Plain water
- Regular OR diet soda
- A sports drink (like Gatorade, Powerade, G2, etc.)
- Coffee, tea, or a coffee/tea beverage like a latte
- Fruit drinks (like Sunny D, Hawaiian Punch, etc.)
- An energy drink (like Monster, Red Bull, etc.)

*[Tally the total for each beverage category on the board as the participants raise their hands. Include the classroom teacher or other volunteers, and yourself.]*

What do you notice about the drink choices from this class?

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## ADD

### **Variation A – What's in Your Drink?**

A lot of people your age – 63% – regularly drink beverages like energy drinks, sodas, fruit drinks – collectively referred to as **sugar-sweetened beverages**<sup>1</sup>. Why are they so popular? Taste, image, and availability. Look in any vending machine or convenience store refrigerator – the shelves are stocked with hundreds of choices of brightly colored, enticingly packaged drinks. Not to mention all the advertisements you see that promote these products. But have you ever stopped to think about what's in these drinks – and what it does to your health?

- Energy drinks

Energy drinks contain caffeine – and some brands contain a lot of it – as much as 4-5 cups of brewed coffee. How many of you have ever noticed whether your drink has the amount of caffeine listed on it? *[Ask for a show of hands.]* You probably don't realize how much caffeine you are drinking because companies are not required to put it on the label. Other ingredients found in energy drinks can interact with the caffeine and cause your heart to beat irregularly, increase your blood pressure, and make you feel jittery. They can cause anxiety and sleep problems for people your age. Some energy drinks also contain added sugar, which adds calories without adding nutrients.

Experts recommend that teens limit their caffeine intake to 100 milligrams per day; above that, and you might start to experience side effects. This is lower than what the limit for adults is, because teens are still growing and the caffeine has different effects on your brain compared to adults.

- Soda

On average, boys aged 12-19 years consumed about 230 calories per day from sugary beverages, while girls in the same age range consumed about 160 calories per day. These extra calories do not register in your brain, which means your body doesn't feel full after drinking them as it would if you ate them as food. Studies have shown that when people drink more soda, they tend to drink less milk. This means they're not only getting a lot of caffeine and sugar, they're also robbing themselves of important vitamins and minerals. And research shows that if you eat a lot of fast food, you're also more likely to drink sugary drinks than those who don't eat as much fast food<sup>2</sup>. How many of you choose a soda when you're eating at a fast-food restaurant? *[Ask for a show of hands.]*

- Fruit drinks, flavored water, and sports drinks

What's the difference between fruit drinks and 100% fruit juice? *[Allow a couple of participants volunteer an answer. Look for: 100% fruit juice is only the juice from fruit; it has no other ingredients added.]* You might think that a fruit drink is a healthier choice than soda, but in fact, fruit drinks have as much – or more – sugar than some regular sodas. They often contain added colors and flavors, and have little to no actual fruit juice. Even though some brands might add vitamins, they are still not a healthy beverage choice because of the extra calories.

How many of you play some kind of sport? *[Ask for a show of hands.]* What do you typically drink during and after your game? *[Allow for a few responses.]* You might think that sports drinks are good to drink after playing sports. Not necessarily. Most kids do not play sports vigorously enough to need a sports drink to rehydrate – plain old water, or even low fat chocolate milk, are actually better choices for student athletes.

- Water

Good old-fashioned water is still the first choice for a healthy drink. Whether you drink bottled water or water straight out of the tap, it's calorie-free and goes with anything. If you don't like the taste of plain water, you can do things like add fruit slices to jazz it up. Water plays an essential role in a lot of your body's functions. Being properly hydrated with water will help you concentrate, feel more alert, maintain your weight, aid in proper digestion, and keep your skin looking smooth. Aim for 6-8 cups of water per day.

- Milk

Low fat milk (or 1% milk) is another great beverage option for growing teens. Milk has protein, calcium, and other vitamins and minerals that are essential for growth and development. Did you know that 90% of your adult bone mass happens by age 18 for girls and age 19 for boys? The pre-teen and teen years are a critical time period for building bone, but least three-fourths of you don't get enough calcium and vitamin D. Experts recommend 3-4 cups of milk or other dairy foods per day for your age group. One 8-ounce cup of milk has 300 mg of calcium. (Be careful about flavored milk; it still has a lot of nutrients, but it also has added sugar, which means more calories. But drinking it in **moderation** can be part of a healthy diet.)

What are your questions about the different drink choices we talked about?



*[If time permits, show the following video clip to the participants. Ask them if they relate to the sentiments expressed in the video.]*

*Sports Drinks and Energy Drinks (2 minutes): <https://www.youtube.com/watch?v=uoYU8ZbHo8Q>*

### **Variation B – A Culture of Caffeine**

Nearly one-third of US teens aged 12-17 years old consume energy drinks<sup>3</sup>. Energy drinks are very popular among young people and are advertised as having benefits such as increased alertness and enhanced performance with sports or test-taking. What makes them so effective? Simply put: caffeine. Caffeine is the major ingredient in energy drinks, and various brands contain a wide range of caffeine – some brands containing up to 500 mg per can or bottle. That would be like drinking 4-5 cups of regular coffee. What do you think would happen to you if you drank 4 cups of coffee at one time? *[Allow for a few participants to respond.]*

There are other ingredients in energy drinks, some of which contain caffeine or mimic caffeine to give you even more of a buzz, such as guarana and taurine. Many energy drinks contain a lot of added sugars as well, up to 50 grams of sugar in a serving, or half your daily sugar allotment. Who can tell us how many teaspoons that is equal to? *[The correct answer is 12.5 teaspoons.]* On the other hand, if you are drinking plenty of water – at least 6-8 cups a day – research shows you're more likely to be alert and energized. And water is 100% caffeine-free.

Too much caffeine can have negative effects on your body. These can include:

- Trembling or racing heart
- Increased blood pressure
- Inability to concentrate
- Increased irritability or anxiousness

Studies have shown that caffeine consumption may also harm a young person's cardiovascular and nervous systems, which are still growing and developing during adolescence. Drinking caffeine regularly can also cause bones to lose calcium, making them weaker over time, which can lead to **osteoporosis**. Has anyone ever heard of osteoporosis or know someone who has this disease? *[Allow for participants to raise their hands.]* Osteoporosis is when your bones become thin, weak, and brittle. It can lead to bone fractures or breaks. *[Hold up the Bones Graphic for the participants to see.]* This picture shows the difference between healthy bone and bone that has osteoporosis. What do you notice about these images?

When you replace milk with caffeinated drinks, this bone loss is made worse. Not only does the caffeine pull stored calcium from your bones, but if you're not drinking milk, then you're not replacing the lost calcium.

The Mayo Clinic recommends that teens limit caffeine intake to 100 mg or less per day, and younger children should not have any caffeine. Because energy drinks are classified as nutritional supplements, they are not regulated like other food products for safety. And,

companies don't have to put how much caffeine is in the drink on the food label, so you may not know how much is in there.

Since it can take up to 12 hours for the effects of the caffeine in one energy drink to clear your body, if you drink energy drinks in the afternoon or evening, it can make it difficult for you to fall asleep at night, or stay asleep. Recent research has uncovered a disturbing trend related to energy drink consumption among teens. Teens who drink energy drinks are more likely to abuse other substances, such as marijuana or alcohol, and are also more likely to be depressed, than teens who don't drink energy drinks. How does knowing this make you feel?



*[If time permits, show one of the following video clips to the participants. Ask them if they relate to the sentiments expressed in the video.]*

*How Does Caffeine Affect You? (3 ½ minutes): <https://www.youtube.com/watch?v=j6SHaQwzefY>*

*Can Energy Drinks Kill You? (3 minutes): <https://www.youtube.com/watch?v=c3GhjaJHO9Q>  
(appropriate for older students)*

### **Variation C – Building up Your Bone Bank with Milk**

Did you know that most of your body's bone growth occurs during the ages of 11-17? In fact, by the time you're 18, 90% of your adult bone mass is formed. In your twenties, your body's bone mass peaks around age 26. This means that after your mid-twenties, your body won't continue to build bone mass. In fact, by the time you're 35, your body slowly begins to *lose* bone mass, and this continues for the rest of your adult life. How many of you think about your bones? *[Ask for a show of hands.]* Actually, right now is the most important time to be thinking about your bones.

So what things affect bone growth in teens? There are actually a lot of things. You can start by making sure you are **getting enough calcium** – 1,300 mg per day, or about 4 servings of dairy products. An 8-ounce glass of low fat milk or an 8-ounce container of regular yogurt each contains about 300 mg of calcium.

Right along with getting enough calcium is **getting enough Vitamin D**. Vitamin D helps your body absorb calcium, and also helps bolster your immune system and keep infections at bay. How much do you need? Experts recommend 600 International Units per day. Don't worry if you don't know what International Units are. What you need to know is that it's tough to get enough Vitamin D through your diet, but if you drink milk that has Vitamin D added to it, that will help a lot. You can also get Vitamin D from being outside or taking a Vitamin D tablet.

You may not have known this, but **protein** plays a big role in helping to build bone mass in your teen years, and maintaining that bone mass as an adult. A glass of milk provides 8 grams of protein. Greek-style yogurt also packs protein: 12 grams in a typical container (about 6 ounces).

Finally, other things you can do to help build and keep bone mass include:

- **Avoiding sodium.** Sodium can keep your bones from storing calcium due to the chemical bonding that happens between sodium and calcium. Processed foods of any kind are chock-full of sodium, so watch how much of these foods you eat.
- **Doing weight-bearing exercise** – 60 minutes, 3 times a week. Who can name some examples of weight-bearing activities? *[Correct responses may include: walking, running, jumping rope, playing basketball, dancing, or lifting weights.]* Biking, skiing, and skating are great forms of exercise, but they don't help strengthen your bones, so you should do a variety of different things.
- **Not smoking.** Teens who smoke have smaller skeletons and less bone mass than those who don't smoke.

If you don't drink milk very often, you can eat other dairy foods to make sure you're getting enough of these important nutrients. Some other good sources of calcium include fortified soy milk, almond milk, or orange juice; broccoli; spinach; almonds; and tofu. And remember, water is always a great, calorie- and sugar-free drink choice too!

Today we're going to sample a simple smoothie recipe that you can easily make at home. This recipe has just four ingredients: strawberries, bananas, yogurt, and orange juice. We used fortified orange juice for an extra boost of calcium and vitamin D. An 8-ounce cup of this smoothie delivers 275 milligrams of calcium, 40 IU's of vitamin D, and 5 grams of protein – all for only 135 calories. And, thanks to the fruit, it also provides a healthy dose of potassium, as well as some fiber. You can swap out different fruits to suit your personal taste preferences.

*[You can make this recipe ahead of time, or, if the setting allows for it, you can make it on-site as part of the lesson delivery. Invite participants to assist with the recipe preparation.]*

What do you think of the smoothie? Is this something you would try at home?



*[If time permits, show the following video clip to the participants. Ask them if they relate to the sentiments expressed in the video.]*

A Calcium Cartoon (1 ½ minutes): <https://www.youtube.com/watch?v=MYsgAOLLK90>

## **APPLY**

### **Variation A – Guess the Sugar Content!**

Now we're going to take a closer look at some popular drink products. We have eight different drinks at this table. First, we'll look at how much sugar is in each one. Who would like to guess how much sugar is in the entire container of this drink?

*[Start with the first beverage container. Ask a volunteer to guess how much sugar is in the entire container. Using the information on the Nutrition Information cards, reveal the actual amount of sugar.]*



Let's measure out how much sugar that is equal to. One sugar cube is the same as one teaspoon of sugar, and it contains 4 grams of sugar. Nutrition labels show the amount of sugar in grams, so you need to divide the amount of sugar by 4 to figure out the number of teaspoons of sugar are in the product. Who would like to volunteer to measure out the sugar into this cup? *[Recruit a volunteer from the audience.]*

*[Repeat this for the remaining 7 products.]*

That's a lot of sugar, wouldn't you say? Now let's look at calories. Sugar provides 4 calories for each gram. So if a drink has 20 grams of sugar, that's equal to 80 calories. Other ingredients in the drink may contain calories, but for many drinks, sugars are the main source of calories.

*[Begin with the first beverage container. Hold up the plastic cup that has the sugar already measured out so the participants can see how much sugar is in the drink. Have the participants take turns guessing how many calories are in that product. Reveal the actual calories after a few guesses. Do this for all 8 products.]*

What do you notice about the relationship between the amount of sugar in each drink and the total calories?

Finally, let's consider caffeine. Which of these products contains caffeine? How much do you guess is in there? It's hard to know because companies don't have to put the amount of caffeine on the label.

*[As participants guess, reveal the actual amounts listed on the Nutrition Information cards. Do each product one at a time.]*

What did you learn from doing this activity? What surprised you?

We just saw how much sugar some of our usual go-to drinks can contain. Even 100% fruit juice can contain a lot of sugar. I've made a simple fruit-infused water for you to try. It's easy to make: all you have to do is soak frozen berries in regular water for a day. Then, remove the fruit pieces from the water and keep it in a pitcher. It tastes fruity, but not overly sweet. It's a refreshing alternative to sugary drinks. You can try it with any type of fruit, such as orange or lemon slices, sliced apples, or kiwi and strawberries. Experiment with your favorite fruit.

### **Variation B – DIY Soda**

We just learned about all the negative health effects that come with drinking sweetened or caffeinated beverages. In addition to the caffeine and calories, if you're drinking a lot of these kinds of drinks, the odds are that you're not drinking enough milk or water.

Yet, we all know that sometimes drinking plain water just doesn't cut it. Let's try a recipe for a simple, home-made lemon-lime soda that provides flavor and fizz without the stuff you don't want. All you need are four ingredients, plus ice. While this recipe does call for sugar, it has a lot less than a commercial soda. In fact, one 12-ounce glass has 80 calories and 19 grams of sugar (or almost 5 teaspoons), compared to 140 calories and 38 grams of sugar (or 8 ½ teaspoons) in a typical commercial lemon-lime soda.

I need some volunteers to help make the soda. First, I need one person to juice the limes. Then I need another person to juice the lemons. *[Recruit two volunteers. Before touching the fruit, volunteers should clean their hands and put on gloves. Have them squeeze the juice from the limes and lemons directly into the pitcher. Ask them to return to their seats when done.]* Now I need someone to measure out the sugar. *[Recruit another volunteer to measure out the sugar and add it to the pitcher, making sure they clean their hands and put on gloves first.]* We'll mix the sugar with the fruit juice before we add the soda water, so that we don't mix away any of the carbonation. *[Once the sugar has been added and mixed, the volunteer can return to their seat.]* Now, the last step is to add seltzer water to the pitcher until it's full. Who would like to help me with this? *[Recruit a new volunteer to add the water, and then have them return to their seat.]* This was easy, and fun to make! Let's taste it together. *[Ask for several volunteers who have not yet helped to assist with pouring and dispensing the samples.]*

Simple DIY lemon-lime soda:

- 2 liters plain seltzer water
- 3 large lemons
- 2 large limes
- ½ cup sugar

Cut lemons and limes in half. Squeeze the juice from the fruit into a 2-quart pitcher. Add the sugar and stir with a long-handled spoon until well-mixed. Fill the rest of the pitcher to the top with the seltzer water. Gently stir with the spoon. Serve over ice.

You may notice that this version of the soda doesn't taste exactly like store-bought lemon-lime soda. It's probably not as sweet, to start with. *[Allow participants to have a discussion about their impressions around the following talking points.]*

- What do you think about this soda?
- What are some other things you notice about it?
- Is it something you'd make at home?
- What might you do to make it more suited to what you like?

*[Note: making the soda can involve some "down time" in larger group sizes. If this is the case, pass out a copy of the Caffeine Crossword worksheet for the group to complete while the volunteers make the soda.]*

### **Variation C – Quiz Team!**

Let's see how much you learned from today's lesson! We're going to divide into two teams. I'll flip a coin to determine which team goes first. In your teams, choose ONE PERSON to be the "spokesperson" for your team. He or she is the ONLY person who can answer for your team.

Here's how it works:

For the team who won the coin toss, the spokesperson will come up to the board and point to which card will be read to your team. Remember, the higher the point value, the harder the question. I'll read the question out loud. Your team will have 15 seconds to discuss the answer. When it's been 15 seconds, the spokesperson will tell me your team's answer. If it's correct, your team gets the full amount of points. Only the spokesperson can answer.

If your answer is not correct, the other team gets a chance to "steal" the points by answering the question. If they come up with the right answer, they get the points. If they have the wrong answer, no one gets the points for that question. *[Note: the True/False questions are not eligible for "stealing."]*

The team who earns the most points wins the game. Are you ready?

*[Play the game until all the questions have been answered or for as long as time permits.]*

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## **AWAY**

*[Pass out a copy of the Drink Tracker to each student.]*

Over the next week, track how many 8-ounce cups of different beverages you drink. Set a goal to drink more water (6-8 cups) and 3 cups of milk. You can use the paper tracker, or if you want, you can download an app for your phone. A couple of good ones are iHydrate for Apple and Hydro Coach for Android.

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## **NOTES**

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## **RESOURCES**

4 Bone Health (2018). *Facts by age group: Teens*. Retrieved from <http://www.4bonehealth.org>

Brazier, Y. (2016, March 8). *Adolescents drink too much caffeine*. Retrieved from <https://www.medicalnewstoday.com>

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Tasevska N, DeLia D, Lorts C, Yedidia M, and Ohri-Vachaspati P. Determinants of sugar-sweetened beverage consumption among low-income children: Are there differences by race/ethnicity, age, and sex? *Journal of the American Dietetic Association*, 117(2017): 1900-1920. DOI: <https://doi.org/10.1016/j.jand.2017.03.013>

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