

**OVERVIEW****BIG IDEA**

Soda and fruit juices are empty calories--they have high levels of sugar and calories. Over-consumption of these beverages can lead to weight problems.

OBJECTIVE

2.6 Identify beverage choices that lead to negative health outcomes.

AGENDA

1. Beverages Graph
2. Reading: Sugary Drinks vs. Water
3. Assess: Top 5 for Water

HOMEWORK

Interview a student from another school about their health policies related to nutrition and fitness.

LESSON 2.6**What's in a Drink?****SUMMARY:**

This lesson exposes students to the major role that beverage choices play in our physical health and the obesity epidemic. First students will review a graph depicting amounts of sugar in various beverages, answering questions to help increase their agility with graphical information. Then students will read and discuss two sections from a report by the Harvard School of Public Health on the association between sugary beverages and weight problems and the benefits of drinking water. They will discuss and think individually with questions sets that follow each excerpt. To assess their understanding, students will devise a "top 5" list of benefits of drinking water (over sugary drinks).



UNIT 2: NUTRITION & FITNESS LESSON 2.6

What's in a Drink?

PH2.6: Identify beverage choices that lead to negative health outcomes

Use the following graph to answer the questions:

1. Which drink in this graph do you consume most often? _____ Least often? _____

2. The sweetest beverage listed in the graph is _____, which has _____ teaspoons of sugar and _____ calories in each 12 ounce serving.

3. The researchers who devised this study of sugar in beverages believe that the food industry should meet a target of _____ teaspoons of sugar and _____ calories in each 12 ounce serving.

4. Besides water, what are some other options for beverages that are considered the “best choice” with the least sugar and calories?

5. A father of three children is trying to provide his kids with a healthy breakfast each day. He tries to avoid sugary cereals and pours them each a glass of orange juice. What recommendations would you make for this father regarding the beverage he is providing for his kids each morning? Explain using evidence.

DO NOW Answers:

1. Which drink in this graph do you consume most often? _____ Least often? _____ (answers will vary)
2. The sweetest beverage listed in the graph is _____, which has _____ teaspoons of sugar and _____ calories in each 12 ounce serving. (cranberry juice cocktail; 12 tsp; 200 calories)
3. The researchers who devised this study of sugar in beverages believe that the food industry should meet a target of _____ teaspoons of sugar and _____ calories in each 12 ounce serving. (3 tsp; 50 calories – or less!)
4. Besides water, what are some other options for beverages that are considered the “best choice” with the least sugar and calories? (tea, coffee, seltzer water)
5. A father of three children is trying to provide his kids with a healthy breakfast each day. He tries to avoid sugary cereals and pours them each a glass of orange juice. What recommendations would you make for this father regarding the beverage he is providing for his kids each morning? Explain using evidence. (He should provide water for his children at breakfast –along with milk so they can get their dairy!—and provide actual oranges or other fruits. Orange juice has 10 tsp of sugar and 170 calories per 12 ounce serving, so it is not a healthy option since it provides empty calories.)



Sugar-Sweetened Beverages and Weight

There's convincing evidence that sugary drinks increase the risk of weight gain, obesity, and diabetes: (34-36) A systematic review and meta-analysis of 88 studies found "clear associations of soft drink intake with increased caloric intake and body weight." (34) In children and adolescents, a more recent meta analysis estimates that for every additional 12-ounce serving of sugary beverage consumed each day, body mass index increases by 0.08 units. (35) Another meta analysis finds that adults who regularly drink sugared beverages have a 26 percent higher risk of developing type 2 diabetes than people who rarely drink sugared beverages. (36) Emerging evidence also suggests that high sugary beverage intake increases the risk of heart disease. (37)

Like refined grains and potatoes, sugary beverages are high in rapidly-digested carbohydrate. Research suggests that when that carbohydrate is delivered in liquid form, rather than solid form, it is not as satiating, and people don't eat less to compensate for the extra calories. (38)

These findings on sugary drinks are alarming, given that children and adults are drinking ever-larger quantities of them: In the U.S., sugared beverages made up about 4 percent of daily calorie intake in the 1970s, but by 2001, represented about 9 percent of calories. (36) The most recent data find that on any given day, half of Americans consume some type of sugared beverage, 25 percent consume at least 200 calories from sugared drinks, and 5 percent of consume at least 567 calories—the equivalent of four cans of sugary soda. (39)

The good news is that studies in children and adults have also shown that cutting back on sugary drinks can lead to weight loss. (40,41) Sugary drinks have become an important target for obesity prevention efforts, promoting discussions of policy initiatives such as taxing soda. (42)

Fruit Juice and Weight

It's important to note that fruit juices are not a better option for weight control than sugar-sweetened beverages. Ounce for ounce, fruit juices—even those that are 100 percent fruit juice, with no added sugar — are as high in sugar and calories as sugary sodas. So it's no surprise that a recent Harvard School of Public Health study, which tracked the diet and lifestyle habits of 120,000 men and women for up to 20 years, found that people who increased their intake of fruit juice gained more weight over time than people who did not. (9) Pediatricians and public health advocates recommend that children and adults limit fruit juice to just a small glass a day, if they consume it at all.

Source: Harvard School of Public Health (<http://www.hsph.harvard.edu/nutritionsource/how-sweet-is-it/>)

34. Vartanian LR, Schwartz MB, Brownell KD. Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *Am J Public Health*. 2007;97:667-75.

35. Malik VS, Willett WC, Hu FB. Sugar-sweetened beverages and BMI in children and adolescents: reanalyses of a meta-analysis. *Am J Clin Nutr*. 2009;89:438-9; author reply 9-40.

36. Hu FB, Malik VS. Sugar-sweetened beverages and risk of obesity and type 2 diabetes: epidemiologic evidence. *Physiol Behav*. 2010;100:47-54.

37. Malik VS, Popkin BM, Bray GA, Despres JP, Willett WC, Hu FB. Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis. *Diabetes Care*. 2010;33:2477-83.

38. Pan A, Hu FB. Effects of carbohydrates on satiety: differences between liquid and solid food. *Curr Opin Clin Nutr Metab Care*. 2011;14:385-90.

39. Ogden CL, Carroll MD, Park S. *Consumption of sugar drinks in the United States, 2005–2008*. Hyattsville, MD: National Center for Health Statistics; 2011.

40. Chen L, Appel LJ, Loria C, et al. Reduction in consumption of sugar-sweetened beverages is associated with weight loss: the PREMIER trial. *Am J Clin Nutr*. 2009;89:1299-306.

41. Ebbeling CB, Feldman HA, Osganian SK, Chomitz VR, Ellenbogen SJ, Ludwig DS. Effects of decreasing sugar-sweetened beverage consumption on body weight in adolescents: a randomized, controlled pilot study. *Pediatrics*. 2006;117:673-80.

42. Brownell KD, Farley T, Willett WC, et al. The public health and economic benefits of taxing sugar-sweetened beverages. *N Engl J Med*. 2009;361:1599-605.

READ:

Many other excellent resources can be found at Harvard's SPH website: <http://www.hsph.harvard.edu/nutritionsource/sugary-drinks-fact-sheet/>

In addition, there are many great articles surrounding controversial policies that have been proposed, or are already taking effect. Examples: 1) NYC attempted ban on large sugary beverages; 2) the recent USDA federal ban on sale of sugary beverages and junk food in school vending machines. These would be great to use to spark interest and debate if time permits.



DISCUSS

Discuss with a partner:

1. Will this information impact your choices of beverages in the future? Why or why not?
2. What should be done about this problem? Consider the roles that different agencies play: the government, beverage companies, schools, health care providers, parents, media, etc.
3. Think about the warning labels on packs of cigarettes. Should sugary beverages carry a similar warning label informing people of their sugar content and the potential risks of obesity and other chronic diseases? Why/why not?

**Water**

Water provides everything the body needs—pure H₂O—to restore fluids lost through metabolism, breathing, sweating, and the removal of waste. It's the perfect beverage for quenching thirst and rehydrating your system. When it comes from the tap, it costs a fraction of a penny per glass. Water should be the beverage you turn to most of the time.

It's impossible to set a single requirement for how much water the hypothetical average American needs each day. The amount you need depends on how much you eat, what the weather is, and how active you are. So instead of setting an estimated average requirement for water, as it has done for other nutrients, the Institute of Medicine has set an adequate intake of 125 ounces (about 15 cups) for men and 91 ounces for women (about 11 cups). Note that this is not a daily target, but a general guide. In most people, about 80% of this comes from beverages; the rest comes from food. As for the oft-repeated nutrition advice to “drink eight glasses of water every day,” there's little evidence to support it, but this would be one excellent way to fulfill most of a person's fluid requirement.

Beverages to limit

Drinks that are loaded with sugar are the worst choice; they contain a lot of calories and virtually no other nutrients. Consuming high-sugar drinks can lead to weight gain and increased risk of type 2 diabetes, cardiovascular disease and gout.

1. The average can of sugar-sweetened soda or fruit punch provides about 150 calories. If you were to drink just one can of a sugar-sweetened soft drink every day, and not cut back on calories elsewhere, you could gain up to 5 pounds in a year. Cutting back on sugary drinks may help control your weight and may lower your risk of type 2 diabetes.
2. Sports beverages are designed to give athletes carbs, electrolytes, and fluid during high-intensity workouts that last an hour or more. For other folks, they're just another source of sugar and calories.
3. Energy drinks have as much sugar as soft drinks, enough caffeine to raise your blood pressure, and additives whose long-term health effects are unknown. For these reasons it's best to skip energy drinks.

Source: Harvard School of Public Health (<http://www.hsph.harvard.edu/nutritionsource/healthy-drinks-full-story/#level-1>)

DISCUSS: If time permits, provide students with some context of the history of cigarette warning labels. The recent proposal for the “gruesome” warning label pictures may interest students as well. See: <http://theweek.com/article/index/216534/the-fdas-gruesome-new-cigarette-warning-labels>

NEW INFO: For more information and a nice list of 6 benefits of water, see: <http://www.webmd.com/diet/features/6-reasons-to-drink-water>



1. What are some reasons people do choose other beverages instead of water?

2. What effect do you think the increase in bottled water consumption has had on the average level of water intake per person in the United States?

3. What are the health benefits of drinking water?



You are a health reporter assigned to cover stories for the local news station. As part of an ongoing series on the obesity epidemic, you are devising a story on beverage choices. In the news segment, your producer wants to share with the public the top 5 reasons they should avoid soda and fruit juice and instead choose water. Using information from this lesson, write your top 5 reasons below:

- 2.
- 3.
- 4.
- 5.

ASSESS: If time permits, allow students to deliver their newscast top 5's in small groups. Additionally, each group could vote on the best student to present to the entire class.



UNIT 2: NUTRITION & FITNESS LESSON 2.6



Interview a friend, sibling, other relative or neighbor that attends a different school (elementary, middle or high school). Ask them about their school's policies and situation in the following categories and then compare to your own school:

Interview Information:

Interviewee Name: _____ Grade: _____
Relationship to you: _____ School: _____

Category	My School	_____ 's School
Availability of sugary beverages in vending machines or hot lunch		
Policy on drinking sugary beverages at school		
Types of snacks offered in vending machine		
Policy on eating "junk food" in school		
Type of lunch provided at school		
Fitness classes / Gym / PE (Required? How long? Intensity level?)		
Sports or fitness clubs offered		
Health education classes		

HOMEWORK: The purpose of this homework assignment is for students to compare and contrast two school policies regarding physical health. Given the varying levels of control over the issue of sugary beverages (and the many other factors that are impacting the obesity epidemic), students can relate to the policies at the school level very easily. They may even be inspired to advocate for better policies.