

Lesson 4: Sip Smart!

Curriculum Expectations

Health and Physical Education:

- Grade 3:** 1.1, C2.1
- Grade 4:** 1.1, C2.1 C3.1
- Grade 5:** 1.1, C2.1
- Grade 6:** 1.1, C3.1
- Grade 7:** 1.1, C2.1

Science

Understanding Life Systems:

- Grade 3:** 2.7
- Grade 4:** 2.6
- Grade 5:** 2.5
- Grade 6:** 2.5
- Grade 7:** 2.5

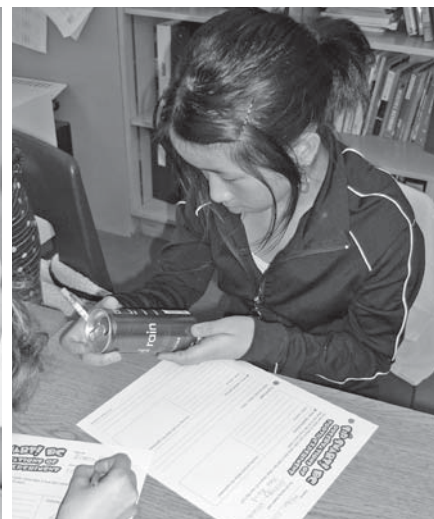
Learning Goals

By the end of this lesson, students will be able to:

- Use self-awareness and self-monitoring skills to analyze class healthy drink choices.
- Explore the effects of various sugary drink ingredients on the body.
- Communicate research findings in a variety of forms for different audiences.

Facility: Classroom
Time: 40 minutes

Materials	
Grades: All	Shopping List
<ul style="list-style-type: none"> • Teacher Resources: <ul style="list-style-type: none"> – Teacher Resource 3: Drink Report (from Lesson 2) – Teacher Resource 9: Acid in Drinks (from Lesson 3) – Teacher Resource 10: “Tooth” Experiment Report (from Lesson 3) – Teacher Resource 14: Tricky Questions for Advanced Scientists • Student Resources: <ul style="list-style-type: none"> – Student Resource 5: Observations of “Tooth” Experiment (from Lesson 3) • Drink Diary Calculator • The “Tooth” Experiment • Assessment Tools: <ul style="list-style-type: none"> – Assessment Tool 1: Anecdotal Recording Chart – Assessment Tool 2: Sip Smart!™ Ontario Drink Diary – Assessment Tool 3: Observations of “Tooth” Experiment • Containers with “teeth” from Part 1 • Paper towels • Sink to drain liquids 	N/A



Minds On: Drink Report 3

Activity Big Idea

- The number and size of servings we drink affect the amount of sugar we consume.
- Knowing what is in drinks helps us to make healthy choices.

Activity

All Grades

- Report results of last drink diary to the students using Teacher Resource 3: *Drink Report*.
- Discuss results. Example: discuss that many factors may influence results, such as students becoming more aware of what they are drinking as compared to the beginning of the program, and are reporting more accurately as a result. Changes in weather or season may influence drink choices also; hot chocolate vs. lemonade and iced tea.
- Compare the results of the *Drink Diary* from Lessons 1, 2 and 3.
- Discuss decreases in consumption of sugary drinks and/or any increases in healthy choices.

Assessment

Teacher observation with anecdotal writing of students' application of self-monitoring skills as they demonstrate their ability to make healthier choices using Assessment Tool 2: *Sip Smart!™ Ontario Drink Diary*.

The Punchline!

- Generally have enough water to have healthy bodies.
 - Seem to be making different (healthier?) drink choices.
 - May be choosing (or not) smaller sizes of drinks.
 - Could be reading labels before choosing a drink.
- You will need to draw out learnings from the data on the report. The above are examples.



Action: “Tooth” Experiment, Part 2

Activity Big Idea

- Some ingredients other than sugar, such as acid and caffeine, can damage our health.

Activity

All Grades

- Ask students to:
 1. Drain off the liquid and place “tooth” on a paper towel.
 2. Find Student Resource 5: *Observation of “Tooth” Experiment*.
 3. Write down observations. Helpful cues are: change of colour, shape, texture, size.
 4. Draw a (coloured) picture of their “tooth”.
 5. Discuss in their group what happened to their “tooth” and write their conclusion.
 6. Compare results with “tooth” in water.
- Let each group share their observations and present them using Teacher Resource 10: *“Tooth” Experiment Report*. Discuss if the hypothesis was supported by the observations.
- Use the questions on Teacher Resource 14: *Tricky Questions for Advanced Scientists* to check the students’ understanding. Show Teacher Resource 9: *Acid in Drinks* again, while discussing results.

Assessment

Teacher observation with anecdotal writing of students’ ability to communicate experiment procedure, observations, and results using Assessment Tool 1: *Anecdotal Recording Chart* and students’ ability to consider the effects of sugar, caffeine, and acid on their body, including oral health using Assessment Tool 3: *Observations of “Tooth” Experiment*.

Activity Tips

After at least two weeks the students will probably have the following observations:

Beverage	Texture	Colour	Explanation
Water	No changes	No changes	<ul style="list-style-type: none">• Neither acid, nor colour in water.
Apple Juice	Softer texture, squishy, mouldy	Light brown	<ul style="list-style-type: none">• Teeth with some organic material on their surface make a great substrate for mold to grow, in the presence of moisture and sugar.• Acid causes dental erosion. Teeth soften and dissolve.
Clear pop	Softer, holes, dissolves, squishy	Slight changes, yellow	<ul style="list-style-type: none">• Food colouring in drinks stains and colours teeth.• Acid causes dental erosion. Teeth soften and dissolve.

Beverage	Texture	Colour	Explanation
Diet Cola	Softer, holes, dissolves, squishy	Dark, almost black (same colour as cola)	<ul style="list-style-type: none"> • Acid causes dental erosion. Teeth soften and dissolve. • Food colouring in drinks stains and colours teeth. • There is no sugar in diet cola. It is the acid that causes erosion!
Cola	Softer, holes, dissolves, squishy	Dark, almost black (same colour as cola)	<ul style="list-style-type: none"> • Acid causes dental erosion. Teeth soften and dissolve. • Food colouring in drinks stains and colours teeth.
Energy Drink	Softer, holes, dissolves, squishy, shrinks	Dark, depending on brand: dark brown, red, yellow, green or black, white deposit	<ul style="list-style-type: none"> • Acid causes dental erosion. Teeth soften and dissolve. • Food colouring in drinks stains and colours teeth.

It is important to note that the “tooth” experiment is different from what occurs in our mouths when we drink sugary drinks because:

1. The bone or “tooth” sits in each acidic sugary drink for two weeks or more, but we don’t usually hold drinks in our mouths for this long;
2. When we place the bone or “tooth” in different acidic sugary drinks, the only factor acting on the “tooth” is the acidity of the drink. Recall that when we sip a sugary drink, the sugar interacts with the bacteria in our mouths to produce acid. Once this acid is made, it lasts for about 20 minutes, after which the saliva in the mouth neutralizes the acid, and the “acid attack” ends.

Dental Erosion: the loss of the hard mineralized surface of the tooth structure due to chemical dissolution by acids.

Acids that may be found in drinks:

- Ascorbic acid (also known as vitamin C).
- Phosphoric acid.
- Citric acid.
- Lactic acid.

The Punchline!

The ingredients in some drinks (sugar and acid), along with naturally occurring bacteria in your mouth, affect your teeth. The combination of bacteria and sugar in sugary drinks form acid which can lead to tooth decay.

Consolidation: 3, 2, 1 Reflection

Activity Big Idea

- Knowing what is in drinks helps us to make healthy choices.

Activity

All Grades

- Working individually students complete an Exit Card or journal entry identifying three things they learned throughout the lesson, two concepts they would like to learn more about, and one step they will take to promote what they've learned to others.
- Students share their responses with a partner before submitting to the teacher for review.

Assessment

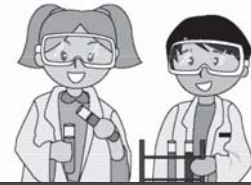
Teacher observation with verbal feedback of students' self-monitoring of their ability to make healthier drink choices and promote healthier choices to others using Assessment Tool 1: *Anecdotal Recording Chart*.



Teacher Resource 14: Tricky Questions for Advanced Scientists



TRICKY QUESTIONS FOR ADVANCED SCIENTISTS



Drink	Conclusion (= explain what happened to your tooth)
Regular cola	
Diet cola	
Clear pop	
Energy drink	
Apple juice	
Water	

Tricky questions for advanced scientists:

1. Which drink damages our teeth the least?

2. If we want a sugary drink once in a while, what can we do to reduce the "acid attack"?

3. Diet pop has no sugar. Why does the tooth in diet cola look exactly like the tooth in cola?
