

## SUGGESTED TIMING

75 min including brainstorming and the Science and Media Link

## MATERIALS

- DVDs of movies or television series such as *E.T.*, *Mission Impossible*, or *24* (optional)
- chart paper and markers

## BLACKLINE MASTERS

OHT D–1 Examples of Advertising Techniques

## Overall Expectations

**SIMV.01** – explain how science-related information is presented in print and electronic media for different purposes and audiences

**SIMV.02** – investigate science-related information presented in print and electronic media using appropriate research and reporting skills

**SIMV.03** – evaluate claims and presentations of science-related information in media

### Diagnostic Assessment

Brainstorming with the class should give you a sense of students' general understanding of science and the media. Some things to consider:

- What do students already know?
- How familiar are students with advertising techniques?
- Can students see a pattern in the techniques used to target consumers in their age category?

## Activity Planning Notes

We are bombarded by literally hundreds of advertisements every day: billboards, radio and television commercials, pop-up ads on the Internet, specially painted buses and trains, as well as ads in newspapers and magazines. This unit is designed to get students thinking about the tricks and techniques that advertising companies use to persuade consumers to purchase their products.

As a class, read the introductory paragraphs. Ask students to identify some of the ways that people in the media talk to them. Use **OHT D–1 Examples of Advertising Techniques** to keep track of all student ideas. You may wish to have students record all of these ideas in their student resource or on chart paper.

Alternatively, you may wish to have students classify the messages they hear by adding the following headings to the mind map: Useful Information, Think or Act, Purchase Goods or Services.

Use the questions on page 275 to focus students on the main theme of this unit.

The Science and Media Link on page 275 is designed to make students more aware of teen smoking. This activity is linked directly to the Unit D Task on Tobacco and Health.

The latest trend in advertising is to show stars of popular movies or television shows using certain product(s). This practice is called product placement. Discuss with students where they may have seen product placements. If possible, use clips from different movies or TV shows to demonstrate product placement techniques. For example, in the movie *E.T.*, the alien's favourite candy is Reese's Pieces. Apple® placed its laptop in movies such as *Mission Impossible*. You could also ask students what products are placed in popular reality television shows (*American Idol*: Coca Cola; *Survivor*: Doritos and Mountain Dew).

### Check Your Understanding Answers (page 275)

1. “And now for a public service announcement”
2. “Buy now!”

### Making Connections Answers (page 275)

3. a) TV and radio ads  
b) Newspaper, TV, and radio ads  
c) Billboards and magazine ads

### Check Your Understanding Answers (page 277)

1. d) All of the above techniques are used.
2. a) Putting a product where people can see it.

### Making Connections Answers (page 277)

3. Answers may vary and could include the following:

- by linking the cigarette brand with popular sporting events
  - by having popular stars smoke their brand in a movie or TV show
  - by suggesting in their advertisements that smokers are part of a “group” that teenagers could belong to
4. Student answers will vary. Many will admit they are influenced by ads and will explain why. Some may claim they are not affected by ads. In this case, ask them to finish off some ad jingles and then discuss why they remember them. Explain that anyone who has ever bought an item after seeing it advertised on TV has been influenced by advertising techniques.

## Science and Media Link (page 276)

You may wish to do this before having students brainstorm advertising techniques. As a class, review what the students pictured above the Science and Media Link are saying. Invite classroom smokers to report on why they started to smoke.

Then read the Science and Media Link as a class. Have students underline each of the techniques used by smoking advertising and provide an example from their own experience.

Have students answer the questions on page 277.

## Alternative Activity

- Many web sites, such as How Stuff Works and Kidzworld, provide information but are also full of ads. Consider having students read the information on product placement presented in these two sites and, at the same time, have them count the number of ads and list the advertising techniques used by the designers of these web sites.

### Accommodations

- Use **OHT D–1 Examples of Advertising Techniques** in a brainstorming session with your students. If some students have difficulty writing the ideas into their own map, consider providing a photocopy of your OHT at the end of the session and have them staple or glue it into their student resource.

### Technology Links

- For more information on product placement, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Product Placement.

# Activity Preparation for Chapter 13

Activity/Investigation	Advance Preparation	Time Required	Other Considerations
<i>What's Going On? Compare Food Labels</i> (page 280) (TR page 311)	<ul style="list-style-type: none"> <li>• 2 to 3 days before               <ul style="list-style-type: none"> <li>– Locate <b>OHT D–3 Compare Food Labels</b>.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 20 min</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure students understand Nutrient Facts labels on food labels before doing this activity.</li> </ul>
<i>Try This!</i> (page 281) (TR page 312)	<ul style="list-style-type: none"> <li>• 2 to 3 weeks before               <ul style="list-style-type: none"> <li>– Book computers with Internet access in a lab or the library.</li> <li>– Check that students can access the web sites. Have filters removed if sites are blocked.</li> </ul> </li> <li>• 1 day before               <ul style="list-style-type: none"> <li>– Photocopy <b>BLM 13–2 Try This! Charts, Master 1 Narrative Lab Report, and Assessment Master 17 Narrative Lab Report Checklist</b>.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 20 min</li> </ul>	<ul style="list-style-type: none"> <li>• Check out some possible web sites. Some suggestions are provided in the Technology Links.</li> <li>• Some students may have difficulty finding information for specific foods they consumed. In that case, suggest students analyze an alternate food.</li> </ul>
<i>Try This!</i> (page 282) (TR page 313)	<ul style="list-style-type: none"> <li>• 2 to 3 days before               <ul style="list-style-type: none"> <li>– Arrange for students to bring in labels from different brands of the same food product that contain varying amounts of fat.</li> </ul> </li> <li>• 1 day before               <ul style="list-style-type: none"> <li>– Photocopy <b>BLM 13–2 Try This! Charts</b>.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 20 min</li> </ul>	<ul style="list-style-type: none"> <li>• In advance, collect some additional food labels in case students don't bring in enough labels.</li> </ul>
<i>Find Out: Coke Classic™ vs. Diet Coke™</i> (page 288) (TR page 318)	<ul style="list-style-type: none"> <li>• 2 to 3 days before               <ul style="list-style-type: none"> <li>– Purchase several 355 mL cans of Coke Classic™ and Diet Coke™.</li> <li>– Purchase sugar and aspartame or other artificial sweetener.</li> </ul> </li> <li>• Day before               <ul style="list-style-type: none"> <li>– Photocopy <b>BLM 1–1 Predict, Explain, Observe, Explain</b> and any other blackline masters you decide to use.</li> <li>– Pre-measure 42 g of sugar and 100 mg of aspartame or other artificial sweetener (optional).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 20 min</li> </ul>	<ul style="list-style-type: none"> <li>• More advanced students may use <b>BLM 13–4 Calculating the Density of Coke Classic™ and Diet Coke™</b>.</li> </ul>
<i>Try This!</i> (page 289) (TR page 319)	<ul style="list-style-type: none"> <li>• 2 to 3 days before               <ul style="list-style-type: none"> <li>– Purchase several same-size cans of various drinks.</li> </ul> </li> <li>• Day before               <ul style="list-style-type: none"> <li>– Photocopy <b>Assessment Master 2 Cooperative Group Work Rubric</b>.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 20 min</li> </ul>	<ul style="list-style-type: none"> <li>• This activity is similar to Find Out: Coke Classic™ vs. Diet Coke™.</li> </ul>
<i>Try This!</i> (page 291) (TR page 323)	<ul style="list-style-type: none"> <li>• 2 to 3 weeks before               <ul style="list-style-type: none"> <li>– Book the computer lab or library for student research.</li> </ul> </li> <li>• Day before               <ul style="list-style-type: none"> <li>– Photocopy <b>BLM 13–5 Acid Reflux, Assessment Master 15 Visual Presentation Checklist</b> (optional), and <b>Assessment Master 16 Visual Presentation Rubric</b>.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 15 min for Internet research</li> <li>• 30 min to create poster</li> </ul>	<ul style="list-style-type: none"> <li>• Make a bookmark for one or two web sites ahead of time.</li> </ul>
<i>Find Out: Testing Antacids</i> (page 293) (TR page 324)	<ul style="list-style-type: none"> <li>• 2 to 3 days before               <ul style="list-style-type: none"> <li>– Purchase materials.</li> <li>– Make the dilute vinegar solution (1 mL of vinegar in 150 mL of distilled water).</li> </ul> </li> <li>• 1 day before               <ul style="list-style-type: none"> <li>– Photocopy <b>Assessment Master 10 Using Tools and Equipment Rubric</b>.</li> </ul> </li> <li>• Day of               <ul style="list-style-type: none"> <li>– Set out materials.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• 25 min</li> </ul>	<ul style="list-style-type: none"> <li>• In advance, test this activity using the two brands of antacid you chose. You may have to adjust the dilution of vinegar you add, depending on the ability of the antacids to neutralize the acid.</li> </ul>

# Materials Needed for Chapter 13

Activity/Investigation	Apparatus	Materials	Blackline Masters
<i>What's Going On? Compare Food Labels</i> (page 280) (TR page 311)			<b>Recommended</b> OHT D-3 Compare Food Labels
<i>Try This!</i> (page 281) (TR page 312)	<ul style="list-style-type: none"> <li>computers with Internet access</li> </ul>		<b>Recommended</b> Master 1 Narrative Lab Report BLM 13-2 Try This! Charts Assessment Master 17 Narrative Lab Report Checklist
<i>Try This!</i> (page 282) (TR page 313)		<ul style="list-style-type: none"> <li>labels from 3 different brands of the same food product</li> </ul>	<b>Recommended</b> BLM 13-2 Try This! Charts
<i>Find Out: Coke Classic™ vs. Diet Coke™</i> (page 288) (TR page 318)	<ul style="list-style-type: none"> <li>digital scale or balance</li> <li>4 L pail</li> </ul>	<ul style="list-style-type: none"> <li>355 mL can of Coke Classic™</li> <li>355 mL can of Diet Coke™</li> <li>3 L water</li> </ul>	<b>Recommended</b> BLM 1-1 Predict, Explain, Observe, Explain <b>Optional</b> BLM 13-4 Calculating the Density of Coke Classic™ and Diet Coke™ Assessment Master 6 Scientific Communication Rubric
<i>Try This!</i> (page 289) (TR page 319)	<ul style="list-style-type: none"> <li>digital scale or balance</li> <li>4 L pail</li> </ul>	<ul style="list-style-type: none"> <li>same-size cans of various drinks</li> <li>3 L water</li> </ul>	<b>Recommended</b> Assessment Master 2 Co-operative Group Work Rubric
<i>Try This!</i> (page 291) (TR page 323)	<ul style="list-style-type: none"> <li>computers with Internet access</li> <li>scissors</li> </ul>	<ul style="list-style-type: none"> <li>poster paper</li> <li>coloured pencils or markers</li> <li>glue</li> </ul>	<b>Recommended</b> BLM 13-5 Acid Reflux Assessment Master 16 Visual Presentation Rubric <b>Optional</b> Assessment Master 15 Visual Presentation Checklist
<i>Find Out: Testing Antacids</i> (page 293) (TR page 324)	<ul style="list-style-type: none"> <li>2 small beakers</li> <li>medicine dropper</li> </ul>	<ul style="list-style-type: none"> <li>2 brands of powdered antacid</li> <li>dilute vinegar solution</li> <li>pH paper</li> <li>pH indicator strip</li> </ul>	<b>Recommended</b> Assessment Master 10 Using Tools and Equipment Rubric

# CHAPTER 13 Media and Food Products (page 280)

## SUGGESTED TIMING

30 min

## MATERIALS

- a variety of advertisements (e.g., in magazines; videotaped from television; taped from radio; photographed from billboards)

## BLACKLINE MASTERS

OHT D-2 Advertising Claims

## Overall Expectations

**SIMV.01** – explain how science-related information is presented in print and electronic media for different purposes and audiences

**SIMV.02** – investigate science-related information presented in print and electronic media using appropriate research and reporting skills

**SIMV.03** – evaluate claims and presentations of science-related information in media

## Key Terms Teaching Strategies

Have students complete some or all of the following activities to help them learn and remember the key term:

- Write a definition for the term in their Science Log. You may wish to have students keep a glossary at the back of their Science Log.
- Determine the advertising claims made in examples of advertisements that you provide. At the end of the chapter, revisit their answers.

Help students remember the key term by posting it on a science word wall.

## Reading Icon Answer (page 278)

1. Students should underline the following advertising claims:

- sandwich ad: It tastes great and it's good for you too.
- antacid ad: It works!
- sauce ad: Have a fiesta without the fat...And for sure, no sugar added.

## Activity Planning Notes

Use **OHT D-2 Advertising Claims** to help students determine the advertising claims made in the visuals on page 278. Focus students' attention on who makes the claim in each ad.

Have students complete and then discuss questions 2 to 4 on pages 278 and 279.

Consider using the following overhead transparency:

- **OHT D-2 Advertising Claims**

### Making Connections Answers (page 279)

#### 2. Sample answers:

	Chicken Salad Sandwich	Tummy Tamer	Low-Fat Fiesta Sauce
a)	doctor (or an actor dressed as a doctor)	Harvey, an ordinary guy	no-one
b)	less fat than in hamburger or tuna salad sandwich	proven remedy for excess acid (according to graph)	no fat no added sugar
c)	doctor is spokesperson	Harvey says it works	big lettering
d)	<ul style="list-style-type: none"><li>amount of fat in each food</li><li>whether the doctor is a doctor or an actor</li></ul>	<ul style="list-style-type: none"><li>who proved the remedy</li><li>what the graph means</li></ul>	<ul style="list-style-type: none"><li>low fat means under 3 g of fat per serving; serving of sauce is small</li><li>no sugar added does not mean it contains no sugar</li></ul>

#### 3. Sample answer:

- People trust doctors and know they are reliable sources of information.

#### 4. Answers may vary. Accept any reasonable justification.

- a) textbooks: yes: The writers are teachers and want students to have the facts.
- b) Internet: yes and no: Anyone can put information on the Internet and there is no check to make sure it is correct.
- c) Radio morning show: probably yes: The radio station gets information from reliable sources.
- d) Government pamphlets: usually yes: The government is considered a reliable source of information.
- e) Food advertisements: no: Companies advertise to sell products and may stretch or bend the truth to do so. There are regulations, however, on how far companies can stretch the truth.
- f) Science experts: usually yes: Scientists employed by a food company might not present all the information about a product.

### Alternative Activity

- Have students invent a new product on paper and create a magazine ad for it. If students have access to a computer, they could use clip art and graphics software. Make sure that their ad includes an advertising claim.

# 13.1 Looking at Food Labels (page 280)

## SUGGESTED TIMING

40 min including the Science and Literacy Link  
20 min for What's Going On?  
20 min for Try This! on page 281  
20 min for Try This! on page 282

## MATERIALS

- Canada's Food Guide (downloads or print copies)
- 2 identical cans of soup or other processed food
- food labels from a variety of food products
- digital balance
- chart paper and markers
- computers with Internet access (optional)

## BLACKLINE MASTERS

Master 1 Narrative Lab Report  
BLM 13–1 Blank Nutrition Facts Labels  
BLM 13–2 Try This! Charts  
BLM 13–3 Testing for Fats in Foods  
OHT D–3 Compare Food Labels  
Assessment Master 17 Narrative Lab Report Checklist

## Specific Expectations

**SIM1.01** – identify the ways in which scientific information is conveyed

**SIM1.03** – explain how different formats used in the media to present science information target specific audiences

**SIM3.01** – formulate testable questions about science-related claims and representations in the media

**SIM3.02** – develop procedures to assess these claims and representations, using information research and/or laboratory investigations

## Key Terms Teaching Strategies

Have students complete some or all of the following activities to help them learn and remember the key terms:

- Write definitions for the terms in their Science Log. You may wish to have students keep a glossary at the back of their Science Log.
- Write a paragraph that contains the three key terms.

Help students remember the key terms by posting them on a science word wall.

### Reading Icon Answer (page 284)

1. Students should highlight the material in Column 3 for each type of fat.

### Reading Icon Answer (page 285)

1. Students should underline:
  - LDL: blocks blood vessels; increases the risk for heart attacks and strokes; reduces the amount of HDL cholesterol in the blood
  - HDL: protects against heart disease

## Activity Planning Notes

In advance, download or order copies of Canada's Food Guide for your students. See the Technology Links at the end of this section.

Bring in two identical cans of soup or other processed food. Remove the label from one can. Use the following questions to lead a class discussion:

- Which can of food would you buy at the grocery store? Why? (can with label; don't know what is in the other can)
- What information is provided on the food label? (e.g., type of food, ingredients)
- What information is provided on the Nutrition Facts label? (e.g., ingredients, % Daily Value)
- Why do you think it is important for people with food allergies to get correct information about the ingredients in food that they buy?

Photocopy and distribute **BLM 13–1 Blank Nutrition Facts Labels**. Have students complete one of the blank food labels for the soup or other food product. For homework, have students fill in the Nutrition Facts labels for two of their favourite foods.

Ask students which foods do not have Nutrition Facts labels (fruits, vegetables, fresh meats, restaurant meals). How can they find out the nutrients for these foods? Tell students that Canada's Food Guide and the Food Composition Database (see Technology Links on page 313) provide this information.

After students complete the What's Going On? activity, as a class read the paragraph about advertising claims on page 282. Have students circle the amount of fat on the yogurt label.

Have volunteers read the next paragraph explaining the Canadian Food Inspection Agency's definition of fat free. If you have access to a digital balance, demonstrate what 0.5 g of butter or oil looks like.

Then have students work individually or in pairs to read and answer the questions on page 282 and 283 before discussing the answers in a class discussion. Make sure to clarify student understanding about fat-free, low-fat, and light or reduced-fat foods.

Be sensitive to students who find the discussion about fats (page 284) stressful, particularly those who are dealing with eating disorders. Be careful to give fact-based messages.

Challenge students to identify advertisements about dietary fat that they are familiar with. These could be weight-loss products or services, public service announcements, or products that advertise the ability to lower fat. Use chart paper to group the advertisements into categories as students mention them (e.g., fitness centres, foods, nutritional supplements). Have students compare ads that sell something with those that make consumers aware of healthy food choices. Help students make the connection between advertising and selling good health.

Most students will tell you that all fat is bad for you. This is simply not true. Explain that nervous tissue is made up mostly of fat and that a diet without fat for a baby or young child can result in poor brain development. Explain that bad fats (saturated and trans fats) increase the risk for certain diseases while good fats

(monounsaturated and polyunsaturated fats) lower the risk. The key is to substitute good fats for bad fats.

It might shock your students to see exactly how much fat, specifically saturated and trans fats, that they take in during a day or even a meal. The web sites mentioned in the Try This! (page 281) activity notes can give students an idea of just how much bad fat they eat everyday.

### Accommodations

- Some students might have trouble with the % Daily Values when they read the food labels. Explain that scientists have determined how much of each type of ingredient makes up a healthy diet. If you add up the amounts on each label in your diet, you can determine if you are eating a healthy diet.
- Pair ESL and LD Learners with students who have stronger language skills. Remind students to refer to their Science Log when they are confused about the key terms.

As a class, read and discuss the Science and Literacy Link on page 285. Before students answer question 1, suggest that they use one colour to underline the words that describe HDL and another colour for LDL.

Have students work on their own to answer questions 2 and 3 on page 285 before discussing their answers with a peer, and then with the class. Note if any advertising claims for question 3 mention fat free or low fat, they must be accurate in terms of the requirements for claiming to be so, as presented on pages 282 and 283.

Consider collecting the advertising claims and making a class display.

Consider using the following blackline master:

- **BLM 13–1 Blank Nutrition Facts Labels**

#### Check Your Understanding Answers (page 282)

1. a) No.  
b) 0.4 g of fat per serving

#### Making Connections Answers (page 282)

2. No.
3. Yes. Sample answer:
  - The company can claim that it is fat free because it respects the Canadian Food Inspection Agency's regulations.
4. Sample answer:
  - The food label shows what the product actually contains, while the advertising claim may be misleading.

#### Check Your Understanding Answers (page 283)

5. a) cottage cheese: low fat  
b) plain yogurt: no legitimate fat-related claim

- c) angelfood cake: fat free
- d) vanilla ice cream: no legitimate fat-related claim

#### Making Connections Answer (page 283)

6. Opinions may vary. Look for an opinion and a supporting point. Sample answer:
  - The rules are better for consumers. Consumers can find out if the claims that food producers make about low fat or fat free are true.

#### Check Your Understanding Answers (page 285)

2. a) monounsaturated and polyunsaturated fats  
b) saturated and trans fats

#### Making Connections Answer (page 285)

3. Advertising claims will vary. Students may make claims such as: lower your risk of heart attack or no trans fats.

## What's Going On? Activity (page 280)

### Compare Food Labels

#### Purpose

- Students compare food labels to determine the number of calories and the amounts of fat and salt in certain fast foods.

#### Science Background

Health Canada began a new labelling program in 2003 that requires most foods to bear a standardized nutrition box and allows diet-related health claims. According to the Canadian Food Inspection Agency, food labelling allows consumers to make informed product choices about nutrition, composition, and substances that may have an impact on the health of certain segments of the population. The main legislation dealing with food labelling in Canada is the *Food and Drugs Act*. It prescribes what can appear on food labels and allows voluntary labelling of all foods, including biotechnology-derived foods.

Any producer or retailer that decides to provide information on food labels needs to ensure that the information is true and not misleading. For example, a manufacturer may choose to highlight a new flavour. Such a claim implies that the food has been changed to make it different. The way in which the food has been modified needs to be indicated on the label.

Canada's Food Guide helps Canadians make wise food choices. The Food Guide meets nutrient needs, promotes health, and minimizes the risk of nutrition-related diseases. The Food Guide places food into four groups: grain products; vegetables and fruit; milk products; and meat and alternatives.

The amount of food you need every day from the four food groups depends on factors such as gender, age, body size, activity level, and if you are pregnant or breast-feeding.

For this reason the Food Guide gives a range of number of servings for each food group. For example, male teenagers may choose the higher number while children may choose the lower number of servings.

Energy from food is measured in calories, kilocalories (kcal) or kilojoules (kJ). People who follow the Food Guide will take in between 1800 and 3200 calories daily.

#### Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 days before	• Locate <b>OHT D-3 Compare Food Labels</b> .

#### Suggested Timing

20 min

#### Activity Planning Notes

As a class, read the directions on page 280. Have students complete questions 2 to 5 on page 281.

As a class, discuss the answers. Use **OHT D-3 Compare Food Labels** to complete the table with student input.

#### Accommodations

- Use different colours and **OHT D-3 Compare Food Labels** to help students keep track of the calories, fat, and sodium in each food.

### What's Going On? Answers (page 281)

2.

Amount per Serving	Tuna Salad Sandwich	Triple Burger	Chicken Salad Sandwich
Calories	450	590	555
Fat Amount	22 g	34 g	29 g
% Daily Value	34%	52%	45%
Salt Amount	1190 mg	1070 mg	1127 mg

3. a) the tuna salad sandwich

b) the chicken salad sandwich. The tuna salad sandwich has 50% Daily Value, the hamburger has 45%, and the chicken salad sandwich has 43%.

4. No. It has more calories and fat than the tuna salad sandwich, although it has less salt.

5. a) It depends on what the sandwich is being compared with.

b) No. She is not likely a real doctor.

c) Yes. It does matter because people might believe she is and accept anything she says as the truth.

### Activity Wrap-up

- Ask students to watch a couple of hours of television and record the number of food commercials. Ask them to identify the types of food being advertised and why they think advertisers picked that particular time period to advertise their product.

- Relate the number of calories in each of the fast foods to the daily requirements for calories according to Canada's Food Guide. Find out if teens who ate these foods would be consuming more or less calories than they require for one meal.

### Try This! Activity (page 281)

#### Purpose

- Students research the number of calories, amount of fat, and amount of salt in the last meal that they ate.

### Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 weeks before	<ul style="list-style-type: none"> <li>• Book computers with Internet access in a lab or the library.</li> <li>• Check that students can access the web sites. Have filters removed if sites are blocked.</li> </ul>

1 day before	<ul style="list-style-type: none"> <li>• Photocopy <b>BLM 13–2 Try This! Charts, Master 1 Narrative Lab Report, and Assessment Master 17 Narrative Lab Report Checklist.</b></li> </ul>
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APPARATUS	MATERIALS
<ul style="list-style-type: none"> <li>• computers with Internet access</li> </ul>	

### Suggested Timing

20 min

### Activity Planning Notes

Book the computer lab or library ahead of time. Check out some possible web sites to make sure that students can access them. Some suggestions are provided in the Technology Links.

Some students may have difficulty finding information for specific foods they consumed. In that case, suggest students analyze an alternate food.

Have students use **BLM 13–2 Try This! Charts** to record their findings.

### Accommodations

- Some students may have difficulty finding the web sites. Make a bookmark for one or two web sites to save time and frustration. Alternatively, pair students who have difficulties using computers with students who are comfortable with computers.

- Some students might have trouble visualizing the recommended daily calorie intake for teens. You can explain that a large hamburger, large fries, and a soft drink type of meal provide most of the calories (1500 calories) that they should consume in one day.

### Technology Links

- For more information on food composition, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Food Composition. This web site can help students find nutrient levels in foods that do not have Nutrition Facts labels.
- For more information on online calorie counters, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Calorie Count. These sites give students an idea of how much “bad fat” people take in everyday. Please note that these are commercial web sites and students will be bombarded by advertisements.

### Activity Wrap-up

- Have students who are comfortable share their findings with the class.
- Ask students what they expected to find and what surprised them. Ask how finding out this information might affect their food choices in the future.
- Consider having students complete a narrative lab report using **Master 1 Narrative Lab Report**. Have students check the narrative lab report they wrote using **Assessment Master 17 Narrative Lab Report Checklist** and use the information to make revisions before handing it in.

### Try This! Activity (page 282)

#### Purpose

- Students identify the amount of fat in different brands of the same type of food product.

### Science Background

According to the Health Canada food labelling guidelines, products can only make ingredient claims such as “fat-free” under certain restrictions.

“Fat free” is allowed only if the product also says “low fat” or “low in fat” and contains less than 0.5

grams of fat per 100 grams in a standard food sample.

“Light” foods must be “reduced in fat” or “reduced in calories,” containing for example at least 25 per cent fewer calories than the standard sample.

“Cholesterol free” and “no cholesterol” must have less than two milligrams of cholesterol in the standard sample.

### Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 days before	<ul style="list-style-type: none"><li>• Arrange for students to bring in labels from different brands of the same food product that contain varying amounts of fat.</li></ul>
1 day before	<ul style="list-style-type: none"><li>• Photocopy <b>BLM 13–2 Try This! Charts</b>.</li></ul>

APPARATUS	MATERIALS
	<ul style="list-style-type: none"><li>• labels from 3 different brands of the same food product</li></ul>

### Suggested Timing

20 min

### Activity Planning Notes

In advance, collect some additional food labels in case students don’t bring enough labels.

Either pass the different food labels around the room for students to look at or set them up at stations in different locations and allow students to go to each station.

Have students use **BLM 13–2 Try This! Charts** to record their findings.

### Accommodations

- Students with physical or visual disabilities could be paired with those without disabilities.

### Activity Wrap-up

- As a class, have students discuss the range of advertising claims made on the products. Ask students what they learned from the activity.
- Ask students to explain what the term “fat free” means using their own words.

### Ongoing Assessment

- Use the narrative lab reports that students wrote for the Try This! activity on page 281 to assess their learning. Use student work during the activity to assess their ability to interpret nutrition information on food labels and the Internet.
- Use student work in the Try This! activity on page 282 to assess their understanding of fat content and advertising claims.
- Use answers to questions 2 and 3 on page 285 to assess students’ understanding of fats.

### Technology Links

- For more information on Canada’s Food Guide go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Food Guide.
- For insight into the Canadian Food Inspection Agency labelling guidelines, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to CFIA.
- For more information on nutrition labelling, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Nutrition Facts Labels.
- For more information on low-fat claims, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Low-Fat Claims Don’t Fly. The web site looks at the amount of fat in KFC foods.

### Alternative Activities

- Have students use computer graphics software or paper and pencil to draw a food label for the product that they invented in the Chapter Opener.
- Challenge students to determine which foods contain fats using **BLM 13–3 Testing for Fats in Foods**. Have students smear food samples on brown paper. Foods containing fat leave a translucent stain while those without fat do not produce such a stain.
- Have students develop a graphic organizer about fat and cholesterol in their diet. They could visit the Canada Food Guide web site to help them.

# 13.2 No Sugar Added (page 286)

## SUGGESTED TIMING

60–70 min including the two  
Science and Literacy Links  
20 min for Find Out  
20 min for Try This!

## MATERIALS

- box or can of fruit juice
- box or can of cocktail or drink beverage of the same fruit
- packaging (including the ingredients list) from several food products
- chart paper and markers
- packets of sugar
- several sugar cubes
- digital scale or balance
- computers with Internet access

## BLACKLINE MASTERS

Master 2 Writing an Opinion Paragraph  
Master 3 Centimetre Grid Paper  
BLM 1–1 Predict, Explain, Observe, Explain  
BLM 13–4 Calculating the Density of Coke Classic™ and Diet Coke™  
Assessment Master 2 Co-operative Group Work Rubric  
Assessment Master 6 Scientific Communication Rubric

## Specific Expectations

**SIM1.01** – identify the ways in which scientific information is conveyed

**SIM2.01** – formulate testable questions on science-related claims and conduct investigations based on the concept of a fair test

**SIM2.04** – organize and communicate information collected from lab investigations and information research using graphic organizers

**SIM3.01** – formulate testable questions about science-related claims and representations in the media

**SIM3.02** – develop procedures to assess these claims and representations, using information research and/or laboratory investigations

## Science Background

It is important to communicate sound dietary information to students. The Canadian Food Guide provides excellent information on carbohydrates and their importance in providing the human body with energy. It also explains the importance of controlling the intake of fats and carbohydrates to reduce the health problems associated with obesity.

There are myths about aspartame, several of which are included here:

**Myth:** Daily consumption of aspartame-sweetened products is harmful to your health.

**Reality:** Aspartame has undergone close to 200 studies over the past 20 years and was approved by Health Canada in 1981. The acceptable daily intake recommended by Health Canada is approximately 3000 mg/per person/per day. That amount is equivalent to 100 low-cal yogurt cups (113g), 20 cans of diet soft drink, or 97 packets of sweetener. The average Canadian consumes about 500 mg of aspartame per day.

**Myth:** Aspartame causes headaches.

**Reality:** Aspartame has not been proven to cause headaches. Headaches can be caused by many factors, including stress, lack of sleep, or physiological and psychological disorders.

**Myth:** Aspartame is harmful to people with diabetes because it increases blood sugar levels.

**Reality:** The Canadian Diabetes Association states that all approved sweeteners are suitable for use by all Canadians, including those with diabetes. Since aspartame is a sugar substitute that gives food a sweet taste without raising the blood sugar level, people with diabetes can consume aspartame-sweetened products to increase the variety of foods they can eat.

**Myth:** Aspartame is harmful to pregnant women and children.

**Reality:** Health Canada states that aspartame is safe for pregnant women and children. Both groups have high energy requirements, however, so their diets should contain all the calories required for health, growth, and development.

## Key Terms Teaching Strategies

Have students complete some or all of the following activities to help them learn and remember the key terms:

- Write definitions for the terms in their Science Log. You may wish to have students keep a glossary at the back of their Science Log.
- Write a paragraph that contains the three key terms.

Help students remember the key terms by posting them on a science word wall.

### Reading Icon Answer (page 286)

1. Students should circle: Sugars/Sucres 35 g.

### Reading Icon Answers (page 287)

1. Students should highlight: read any of the words below on a food label.
2. Students should circle the paragraph beginning with “You can estimate...”

## Activity Planning Notes

Ask students about the taste of fruit. Describe it (sweet). Where does the sweetness come from (sugars within the fruit)?

As a class, discuss the food label about sugar on page 286. Help students locate the amount of sugar on the Nutrition Facts label.

Have students compare the amount of sugar in a can of natural fruit juice with the amount in a cocktail or drink version of the same fruit.

Have students check the lists of ingredients on several food packages. This is where they will find the different types of sugar a food product contains. They will find only the total amount of sugar on the Nutrition Facts label. You might use chart paper to record the different types of sugars that students find on the packaging.

Read and discuss the Science and Literacy Link on page 287 together as a class. Bring in some packets of sugar and sugar cubes to show students how much sugar makes up 4 g. Have volunteers use a digital scale or balance to find the mass of sugar in a packet or cube.

Have students answer and then discuss question 3 on page 287 before they begin the Find Out activity on page 288. The Try This! on page 289 can be done as immediate follow up.

Have students read the information for the Science and Literacy Link on page 289. Then ask students to share what they already know about carbohydrates. Students may know about carbohydrates in terms of athletics (e.g., carbohydrate loading) or dieting (e.g., low-carb diets). List their ideas on chart paper and correct any misinformation. Consider having students express their opinion about the role of carbohydrates in the diet.

Have students research aspartame to help answer question 1 on page 289 (see Technology Links on page 320 of this resource).

Consider using the following blackline master:

• **Master 2 Writing an Opinion Paragraph**

**Accommodations**

- Pair ESL and LD Learners with students who have stronger language skills.
- Students with weak math skills could be paired with students who have stronger skills.
- Some students may require assistance with research techniques. Pair students with complementary skills.
- Pair students who have difficulties using computers with those who are particularly adept.
- Allow students some choice in presenting their opinion about aspartame. Students who have difficulty writing might discuss the answers orally.
- Provide students who need more space to record their opinion on page 289 with **Master 2 Writing an Opinion Paragraph**.

**Check Your Understanding Answers (page 286)**

2. a) 35 g  
b) the grapes
3. Answers will vary. Look for the idea that food labels give consumers accurate information about what a product contains so consumers can make healthy choices.

**Making Connections Answer (page 286)**

4. Advice may vary. Accept any reasonable advice. Sample answer:
  - The juice is good but not because of its sugar content. Fruit juice contains vitamins, minerals, and natural chemicals that may help prevent cancers.

**Check Your Understanding Answers (page 287)**

3. a)  $15 \text{ g of sugar} = \frac{15}{4} = 3 \frac{3}{4}$  packets of sugar  
b)  $36 \text{ g of sugar} = \frac{36}{4} = 9$  packets of sugar  
c)  $24 \text{ g of sugar} = \frac{24}{4} = 6$  packets of sugar

**Making Connections Answers (page 289)**

1. a) Answers will vary. Look for at least three claims against aspartame. Sample answers:
  - Daily consumption of aspartame-sweetened products is harmful to health.
  - Aspartame is harmful to people with diabetes because it increases blood sugar levels.
  - Aspartame is harmful to pregnant women and children.
- b) Answers will vary. Look for at least three claims in favour of aspartame. Sample answers:
  - The acceptable daily intake recommended by Health Canada is approximately 3000 mg/per person/per day. The average Canadian consumes about 500 mg of aspartame per day.
  - The Canadian Diabetes Association states that all approved sweeteners are suitable for use by all Canadians, including those with diabetes.
  - Health Canada states that aspartame is safe for pregnant women and children.
- c) Opinions will vary. Look for an opinion and at least three supporting points.

## Find Out Activity (page 288)

### *Coke Classic™ vs. Diet Coke™*

#### Purpose

- Students determine which Coke™ product has the greater density.

#### Science Background

A can of Coke Classic™ contains 42 g of sugar while a can of Diet Coke™ contains 0 g of sugar. A can of Coke Classic™ contains 0 g of aspartame while a can of Diet Coke™ contains 100 mg of aspartame (approximate value).

The formal definition of density is mass per unit volume. Usually the density is expressed in grams per mL or cc. Mathematically, a “per” statement is translated as a division.

In one study, the average densities of Coke™ and Diet Coke™ were determined to be 1.03 g/mL and 0.993 g/mL respectively.

The density of water is 1 g/mL. An object will float in water if its density is less than 1 g/mL. An object will sink in water if its density is greater than 1 g/mL.

Even though the primary component of both types of pop is water, the absence of high glucose/fructose corn syrup in the Diet Coke™ causes a measurable difference in density.

#### Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 days before	<ul style="list-style-type: none"><li>• Purchase several 355 mL cans of Coke Classic™ and Diet Coke™.</li><li>• Purchase sugar and aspartame or other artificial sweetener.</li></ul>
Day before	<ul style="list-style-type: none"><li>• Photocopy <b>BLM 1–1 Predict, Explain, Observe, Explain</b> and</li></ul>

	any other blackline masters you intend to use. <ul style="list-style-type: none"><li>• Pre-measure 42 g of sugar and 100 mg of aspartame or other artificial sweetener (optional).</li></ul>
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APPARATUS	MATERIALS
<ul style="list-style-type: none"><li>• digital scale or balance</li><li>• 4 L pail</li></ul>	<ul style="list-style-type: none"><li>• 355 mL can of Coke Classic™</li><li>• 355 mL can of Diet Coke™</li><li>• 3 L water</li></ul>

#### Suggested Timing

20 min

#### Safety Precaution

- Do not eat or drink anything in the science lab.

#### Activity Planning Notes

The difference between the two densities is real, but very subtle. Make sure to do this activity in a large volume container in order to make the difference as obvious as possible. The density of Coke Classic™ is slightly above 1.0 g/mL and the density of Diet Coke™ is just about 1.0 g/mL. The density of water (at room temperature) is 1.0 g/mL. Assume that the aluminum cans are identical in density.

This activity can be done as a teacher demonstration. Use the Predict, Observe, Explain (POE) method to ensure that students are active participants. Distribute copies of **BLM 1–1 Predict, Explain, Observe, Explain** and explain the method to students.

- Predict: Describe what you are going to do. Then ask students to predict what will happen.
- Observe: Carry out the activity. Have students watch and note/record what happens.

- Explain: Ask the students to hypothesize about why things happened the way they did. Prompt them to attempt to construct some sort of new knowledge.

After the demonstration, have students complete and then discuss the answers on the blackline master.

You might ask students to calculate the density by using the formula  $\text{density} = \text{mass (g)}/\text{volume (mL)}$ .

Density of Coke Classic™:

$$\text{Density} = \frac{381.75 \text{ g}}{355 \text{ mL}} = 1.07 \text{ g/mL}$$

Density of Diet Coke™:

$$\text{Density} = \frac{365.4 \text{ g}}{355 \text{ mL}} = 1.02 \text{ g/mL}$$

### Accommodations

- Some students may have trouble figuring out why there is a difference in density between the two products. Use a digital scale or balance to measure 42 g of sugar and 100 mg of artificial sweetener so students see the difference.
- Students with weak math skills could be paired with students who have stronger skills.

### Find Out Activity Answers (page 288)

3. Sample answer:

Coke Classic™: 381.75 g; Coke Classic™ sinks in water.

Diet Coke™: 365.4 g; Diet Coke™ floats in water.

4. Coke Classic™ sinks in water. Diet Coke™ floats in water.

5. a) The Coke Classic™ is more dense.

b) The Diet Coke™ is less dense.

6. The Diet Coke™ is less dense because it has less solid material dissolved in it. 100 mg of aspartame is much smaller than 42 g of sugar.

### Activity Wrap-up

- Have students answer and then discuss questions 4 to 6 on page 288.
- Have students test low-carb Coke™, C2™, and see where its density falls with respect to the other two. C2™ contains a combination of artificial sweeteners (aspartame, acesulfame potassium, and sucralose, which is Splenda®) in addition to high-fructose corn syrup and/or sugar.
- Relate the density of Coke Classic™ to the mass of sugar that is added to each 355 mL can.
- Emphasize that drinking one can of Coke Classic™ provides 14% of the recommended daily amount of sugar.
- Bring in other products such as energy drinks and compare the amount of sugar in these drinks with the amount of sugar in Coke™.

### Try This! Activity (page 289)

#### Purpose

- Students repeat the Find Out activity on page 288 to test other types of pop and drinks.

### Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 days before	• Purchase several same-size cans of various drinks.

Day before	• Photocopy <b>Assessment Master 2 Co-operative Group Work Rubric</b> .
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APPARATUS	MATERIALS
<ul style="list-style-type: none"> <li>• digital scale or balance</li> <li>• 4 L pail</li> </ul>	<ul style="list-style-type: none"> <li>• same-size cans of various drinks</li> <li>• 3 L water</li> </ul>

### Suggested Timing

20 min

### Activity Planning Notes

Tell student they will compare the density of other drink products. If time permits, have students design a

fair test to compare the density of other drink products. Students would have to make sure that they kept all of the variables constant such as using the same volume of drink container and the same type of container (e.g., aluminum cans).

Have students make a table similar to the one on page 288 to record their results.

### Accommodations

- Have students work in pairs or small groups.

### Activity Wrap-up

- Have students share their findings in a class discussion.

### Ongoing Assessment

- Use the answers to questions 2 to 4 on page 286 to assess students' abilities to read and interpret information on food labels.
- Use student work on **BLM 1–1 Predict, Explain, Observe, Explain** to assess their learning during the Find Out activity. Alternatively, use **Assessment Master 6 Scientific Communication Rubric** to assess the quality of their work.
- Use **Assessment Master 2 Co-operative Group Work Rubric** to assess how well students worked together in the Try This! activity.
- Use the opinion paragraphs about aspartame (page 289) to assess students' abilities to evaluate claims made about food products.

### Technology Links

- For more information on hidden sugars in foods, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Sugar Surprise.
- For more information on soft drinks and sugar, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Soft Drinks and Sugar. Prompt students to note the bias on these web sites.
- For more information on aspartame, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Aspartame.

### Alternative Activity

- Challenge your top-end students with an activity that requires students to take accurate measurements, record data, and calculate the density of Coke™ products. Have students use **BLM 13–4 Calculating the Density of Coke Classic™ and Diet Coke™** to help them. Provide them with **Master 3 Centimetre Grid Paper** to make a graph.

# 13.3 How Do You Spell Relief? (page 290)

## SUGGESTED TIMING

90 min  
15 min for Internet research; 30 min to create poster for Try This!  
25 min for Find Out

## MATERIALS

- several brands of antacids containing advertising claims
- 5 mL each of vinegar, lemon juice, rain (or snow), baking soda, milk of magnesia
- wide-range pH paper and colour scale
- 6 small beakers or medicine-dispensing cups

## BLACKLINE MASTERS

BLM 13–5 Acid Reflux  
BLM 13–6 Neutralizing Acids  
OHT D–4 What Causes Heartburn?  
OHT D–5 pH Scale  
Assessment Master 10 Using Tools and Equipment Rubric  
Assessment Master 15 Visual Presentation Checklist  
Assessment Master 16 Visual Presentation Rubric

## Specific Expectations

**SIM1.01** – identify the ways in which scientific information is conveyed

**SIM1.02** – discuss, using examples, how the method of presenting scientific information connects to the purpose

**SIM1.03** – explain how different formats used in the media to present science information target specific audiences

**SIM2.02** – research science-related information from a variety of electronic and other sources

**SIM3.01** – formulate testable questions about science-related claims and representations in the media

**SIM3.02** – develop procedures to assess these claims and representations, using information research and/or laboratory investigations

**SIM3.03** – evaluate the investigation and suggest improvements

**SIM3.04** – communicate science-related information to a workplace audience

## Key Terms Teaching Strategies

Have students complete some or all of the following activities to help them learn and remember the key terms:

- Write definitions for the terms in their Science Log. You may wish to have students keep a glossary at the back of their Science Log.
- Write a paragraph that contains the key terms in this section.

Help students remember the key terms by posting them on a science word wall.

### Reading Icon Answers (page 291)

2. Students should highlight the esophagus and stomach.

3. Students should underline the paragraph beginning with: “Sometimes the ring...”

## Activity Planning Notes

As a class, read and discuss the visuals on page 290 in the context of media literacy and the kinds of questions that media literate people should ask about a product.

You might bring in several brands of antacids that have advertising claims and have volunteers find and read them to the class. Compare the wording of these claims with the claim in the visual in the student resource.

Do the following demonstration before students complete question 1 on page 290. Use wide-range pH paper to check the pH of small quantities of vinegar, lemon juice, normal rain water, baking soda solution, and milk of magnesia. Use **OHT D-5 pH Scale** to help illustrate the demonstration.

Have students complete and then share their answers to question 1 on page 290 with a partner before sharing them with the class.

Use **OHT D-4 What Causes Heartburn?** to review the key organs involved in digestion. Have students circle the junction of the esophagus and stomach to show where acid reflux occurs, on their copy of the digestive system on page 291.

Have students complete and discuss questions 4 and 5 on page 291 before assigning the Try This! activity.

Use **OHT D-5 pH Scale** to help review pH scales on page 292. Students should understand that this is a logarithmic scale. For example, a pH of 2 is

- 10 times more acidic than a pH of 3
- 100 times more acidic than a pH of 4
- 1000 times more acidic than a pH of 5
- 10 000 times more acidic than a pH of 6, and
- 100 000 times more acidic than a pH of 7 (neutral).

Note that **BLM 13-6 Neutralizing Acids** is an alternative Test It! investigation that introduces students to neutralizing a weak acid using a weak base. You may wish to have students do this activity prior to doing the Find Out activity on page 293.

Consider using the following blackline master and overhead transparencies:

- **BLM 13-6 Neutralizing Acids**
- **OHT D-4 What Causes Heartburn?**
- **OHT D-5 pH Scale**

#### Accommodations

- Pair ESL and LD Learners with students who have stronger language skills. Remind students to refer to their Science Log when they are confused about the key terms.
- Have students colour the blank space below the numerical scale on their copy of the pH scale on page 292. Use red for acid and blue for bases. Different shades of red and blue could signify different strengths of acids or bases.

#### Technology Links

- For activities to help teach media literacy, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Media Awareness.

#### Making Connections Answer (page 290)

1. Answers will vary. Sample answers:
  - Do antacids have any side effects?
  - How quickly do antacids work?

#### Check Your Understanding Answers (page 291)

4. acid reflux, in which stomach acid splashes up into the esophagus

5. Reflux means backflow, and describes what actually happens. Heartburn has nothing to do with the heart.

#### Check Your Understanding Answers (page 292)

1. lemon juice: 2.0; acid milk of magnesia: 10.5; base baking soda: 8.2; base
2. 7.0

### Making Connections Answers (page 293)

8. Answers will vary. Make sure students realize that they should not take Harvey's suggestions at face value. Look for two questions such as:
- What are the ingredients in the antacid?
  - Are there any side effects of these antacids?
  - What should I do if the acid reflux continues?

9. Answers will vary. For example:

- I would use chemical analysis to identify the chemicals in the antacid.
- I would perform fair tests to determine if there are any side effects of the antacid.
- I would recommend that if acid reflux persists to get medical advice.

### Try This! Activity (page 291)

#### Purpose

- Students do research and create a visual about how to avoid acid reflux.

#### Science Background

Gastroesophageal reflux disease (GERD) is the abnormal backflow, or reflux, of stomach acid and juices, the chemicals that break down food in the stomach, into the esophagus.

GERD occurs when the valve between the lower end of the esophagus and the stomach does not close tightly enough. The main symptom of GERD is a frequent uncomfortable feeling of burning, warmth, heat, or pain just behind the breastbone, commonly referred to as heartburn. Overeating or bending forward after eating occasionally causes heartburn and a sour taste in the mouth. Occasional heartburn does not mean that someone has GERD. In a person suffering from GERD, the reflux and heartburn last longer and occur more often.

#### Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 weeks before	<ul style="list-style-type: none"><li>• Book the computer lab or library for student research.</li></ul>
Day before	<ul style="list-style-type: none"><li>• Photocopy <b>BLM 13–5 Acid Reflux, Assessment Master 15</b></li></ul>

**Visual Presentation Checklist** (optional), and **Assessment Master 16 Visual Presentation Rubric**.

APPARATUS	MATERIALS
<ul style="list-style-type: none"><li>• computers with Internet access</li><li>• scissors</li></ul>	<ul style="list-style-type: none"><li>• poster paper</li><li>• coloured pencils or markers</li><li>• glue</li></ul>

#### Suggested Timing

15 min for Internet research; 30 min to create poster

#### Activity Planning Notes

Book the computer lab ahead of time and make bookmarks for one or two web sites.

Provide time for students to explore the web sites before having them write point-form notes using **BLM 13–5 Acid Reflux**, and then designing a poster. Allow students some flexibility in choosing a format to present their findings (e.g., web page).

Consider having students review **Assessment Master 15 Visual Presentation Checklist** so that they are aware of the expectations for the poster.

Display students' completed works in the classroom.

## Accommodations

- Use a computer and LCD projector to project a web site describing how to avoid acid reflux. Use a pointer to highlight key points. You might record some of the ideas on the chalkboard.
- Pair students who have difficulties using computers with those who are quite comfortable using them.
- If students have access to a computer, they may wish to use clip art and graphics software to create their poster. The zoom feature on most photocopiers can be used to enlarge images to poster size.

## Activity Wrap-up

- Have students present their work to the class. Highlight the key information and the features of posters that appeal to the audience.

## Find Out Activity (page 293)

### Testing Antacids

#### Purpose

- Students determine which brand of antacid is better at neutralizing an acid.

#### Science Background

Antacids are bases used to neutralize the acid that causes heartburn. This means that antacids raise the pH of a solution. Despite the availability of many commercial brands, almost all antacids act on excess stomach acid by neutralizing it with weak bases. The most common bases are hydroxides, carbonates, and bicarbonates.

In a neutralization reaction, an acid reacts with a base to produce a form of salt and water. The word equation for a neutralization reaction is: acid + base → salt + water.

For example, some antacid tablets contain the base magnesium hydroxide. Magnesium hydroxide in the tablet reacts with the hydrochloric acid in your stomach. This neutralization reaction is written as: hydrochloric acid + magnesium hydroxide → magnesium chloride + water.

## Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 days before	<ul style="list-style-type: none"><li>• Purchase materials.</li><li>• Make the dilute vinegar solution (5 mL of vinegar in 150 mL of distilled water).</li></ul>
1 day before	<ul style="list-style-type: none"><li>• Photocopy <b>Assessment Master 10 Using Tools and Equipment Rubric</b>.</li></ul>
Day of	<ul style="list-style-type: none"><li>• Set out materials.</li></ul>

APPARATUS	MATERIALS
<ul style="list-style-type: none"><li>• 2 small beakers</li><li>• medicine dropper</li></ul>	<ul style="list-style-type: none"><li>• 2 brands of powdered antacid</li><li>• dilute vinegar solution</li><li>• pH paper</li><li>• pH indicator strip</li></ul>

## Suggested Timing

25 min

## Safety Precautions



- Remind students to wear the safety equipment, in particular eye protection, throughout the activity.

- Caution students to be careful with glass. Point out the brush and pan to pick up any pieces and the container for broken glass, and remind them to inform you about any glass breakage.
- Remind students to clean up the work area and wash their hands thoroughly when they are finished.

### Activity Planning Notes

Make the dilute vinegar solution (acid) by adding 5 mL of white vinegar to 150 mL of water. This will give you solution with an approximate pH of 4.

The activity suggests using two medicine droppers full of vinegar (approximately 2 mL). However, you may wish to use 10 mL of dilute vinegar if your antacids “foam up.” Your students will still see a pH change if they use 10 mL of dilute acid.

Use powdered antacids rather than tablets; otherwise you will need a mortar and pestle to grind the tablets. Powdered or crushed antacids present a larger surface area for the neutralization reaction (similar to chewing an antacid tablet).

Test the two brands of powdered antacids that you will use ahead of time. You may have to adjust the amount or concentration of vinegar you add depending on the ability of the antacids to neutralize the acid.

If you are using very wide-range pH paper, your students may not be able to determine which antacid worked best. Using a pH meter or a narrower range of pH paper provides more reliable data.

As a class, read the directions on page 293 and encourage discussion to make sure everyone understands what to do. Review how to use pH paper and the pH indicator strip before having students start.

Some students may expect a dramatic pH shift. A neutralization reaction shifts the pH toward the base

(alkaline) end of the pH scale. However, depending on the brands of antacid used, the shift may not be great.

### Accommodations

- Do a demonstration of what to do.
- Have students work in pairs or groups of three.
- Students with visual impairments could be paired with other students to carry out the procedure and make observations.

### Technology Links

- For an experiment about the effectiveness of antacids, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to Antacid Experiment. In the experiment, students measure the rate of change in pH of a dilute hydrochloric acid (HCl) solution when antacid tablets are added to it. Students also compare the neutralization ability of a solid antacid tablet with a crushed tablet. Use this web site if your school is equipped with a Pasco™ pH probe and computer interface software.

#### Find Out Activity Answers (page 293)

6. Answers will vary depending on the brands of antacid used. The pH of the vinegar solution will be about pH 4. With the antacids, the pH will rise to about pH 6.
7. Answers will vary depending on the brands of antacid and the pH paper used to test pH. In a mixture with vinegar, the antacid that worked better will have a higher pH.

### Activity Wrap-up

- Have students complete and then discuss questions 6 and 7 on page 293. You might have student pairs discuss their observations with another student pair before discussing them with the class.
- Have students relate this activity to what they learned in the chemistry unit.

### Ongoing Assessment

- Use the opening discussion about media literacy and question 8 on page 293 to assess students' understanding of media literacy and their ability to ask appropriate questions.
- Use questions 4 and 5 on page 291 to assess students' understanding of acid reflux.
- Use **Assessment Master 16 Visual Presentation Rubric** to assess students' posters about acid reflux.
- Use **Assessment Master 10 Using Tools and Equipment Rubric** to assess students' use of materials during the Find Out activity.

### Technology Links

- For an animation that shows the causes of GERD, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to GERD.
- For information about heartburn, hiatal hernia, and gastroesophageal reflux disease (GERD), go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to GERD.
- For information about the pH scale, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to pH.
- For activities using acid-base indicators, go to [www.mcgrawhill.ca/books/Se10](http://www.mcgrawhill.ca/books/Se10) and follow the links to pH Indicators.

### Alternative Activities

- Have more advanced students use **BLM 13–6 Neutralizing Acids** to learn more about neutralization reactions.
- Use some or all of the activities in the following Life Science *ActiveFolders*: Human Body Systems.

# Chapter 13 Review (page 294)

## SUGGESTED TIMING

35–40 min to complete and take up the review, and then assign the Practice Test

## BLACKLINE MASTERS

Master 5 List of Skills  
Master 6 Certificate  
BLM 13–7 Chapter 13 Practice Test  
BLM 13–8 Chapter 13 Test  
BLM 13–9 BLM Answers

## Using the Chapter Review

Depending on your class, students should be able to work through the review at their own pace. In order to have success with the Chapter Review, some students may need to do it in chunks, by completing several questions and then taking them up before continuing. This process will prevent students from completing many questions incorrectly.

Once the review is completed and taken up, assign the **BLM 13–7 Chapter 13 Practice Test** for students to answer individually. They may wish to use their completed review to help them.

## Review Guide

Question	Section(s)	Refer to
1	13.1	The Lowdown on Low Fat (page 283)
2	13.1	The Lowdown on Low Fat (page 283)
3	13.2	Is Sugar Healthy or Harmful? (page 289)
4	13.3	What Causes Heartburn? (page 291)
5	13.1	Compare Food Labels (page 280)
6	13.3	What Are Antacids? (page 292)
7	13.2	No Sugar Added (page 286)
8	13.1	Advertising Claims (page 282)
9	13.1	Compare Food Labels (page 280)
10	13.3	What Are Antacids? (page 292)
11	13.2	Find the Hidden Sugar (page 287)
12	13.1	Compare Food Labels (page 280)

## Accommodations

- Allow students to make a chapter summary page of the key ideas/skills from the chapter. The back of the student resource provides space to do this. Alternatively, you might develop a chapter summary as an entire class.
- If students have difficulty with a particular review question, use the Review Guide to identify the section they need to review.
- **BLM 13–7 Chapter 13 Practice Test** can be customized to produce extra reinforcement questions.

## Summative Assessment

- Have students complete **BLM 13–8 Chapter 13 Test** to assess individual skills.
- You may wish to develop **Master 5 Certificate** to show students what they have learned during this chapter. Cut and paste the related skills from **Master 6 List of Skills**.

**Chapter 13 Review Answers (pages 294–295)**

1. **c)** fat free
2. **b)** low-fat
3. **f)** carbohydrate
4. **g)** acid reflux
5. **e)** food label
6. **a)** antacid
7. No. The juice has the sugar that was contained in the oranges.
8. **c)** Pizza Pizzazz gives the clearest information because the fact can be verified.
9. **a)** 340 calories
  - b)** 14 g fat
  - c)** carbohydrates and protein
10.
  - Acid should be written between the arrows from pH 0 to pH 7.
  - Neutral should be written at pH 7.
  - Base should be written between the arrows from pH 7 to pH 14.
11. **a)–d)** Answers will vary. For example:
  - dextrose
  - corn syrup
  - malt syrup
  - sorbitol
12. **a)** Sandwich C and Sandwich D
  - b)** The serving sizes of Sandwich C and Sandwich D are the same.