

Activity Preparation for Chapter 14

Activity/Investigation	Advance Preparation	Time Required	Other Considerations
<i>Test It! Which Laundry Detergent Cleans Better in Cold Water?</i> (page 298) (TR page 335)	<ul style="list-style-type: none"> • 5 to 6 days before <ul style="list-style-type: none"> – Purchase two brands of cold water laundry detergent. – Obtain fabric samples. – Purchase substances to stain the fabric. – Ask students to bring in 4 L ice-cream pails (if needed). – Tape a TV laundry detergent ad. • 1 day before <ul style="list-style-type: none"> – Organize the materials. – Photocopy any assessment masters you decide to use. • Day of <ul style="list-style-type: none"> – Set out materials. 	<ul style="list-style-type: none"> • 65 min 	<ul style="list-style-type: none"> • Consider reviewing variables and the scientific method using OHT 8 Types of Variables and OHT 12 Scientific Method, respectively. • Students may have two main difficulties: <ul style="list-style-type: none"> – how to plan a fair test. Consider providing Assessment Master 11 Fair Test Checklist to guide students. – how to determine cleaning power. Use prompts to guide students.
<i>Find Out: Homemade Hair Gel</i> (page 302) (TR page 337)	<ul style="list-style-type: none"> • 5 to 6 days before <ul style="list-style-type: none"> – Purchase flax seeds from local health food store. – Purchase other materials as required. – Purchase small gift jars. • 1 to 2 days before <ul style="list-style-type: none"> – Photocopy Master 1 Narrative Lab Report and any other blackline masters you decide to use. • Day of <ul style="list-style-type: none"> – Set out materials. 	<ul style="list-style-type: none"> • 50 min (including 20 min for cooking flax seeds; 30 min for cooling) 	<ul style="list-style-type: none"> • Homemade hair gel should be kept in the refrigerator. Its shelf life is about one week.
<i>Try This!</i> (page 305) (TR page 339)	<ul style="list-style-type: none"> • 2 to 3 weeks before <ul style="list-style-type: none"> – Book computers with Internet access. – Make bookmarks for web sites about chemicals in hair gels. • 1 to 2 days before <ul style="list-style-type: none"> – Photocopy BLM Intro—4 I Found It on the Internet and Master 2 Writing an Opinion Paragraph. 	<ul style="list-style-type: none"> • 35 min 	
<i>Find Out: How Does Commercial Fertilizer Compare With Organic Fertilizer?</i> (page 308) (TR page 343)	<ul style="list-style-type: none"> • 2 to 3 weeks before <ul style="list-style-type: none"> – Purchase radish seeds, vermiculite, and seed trays. • 1 to 2 days before <ul style="list-style-type: none"> – Photocopy Assessment Master 4 Lab Report Rubric, Assessment Master 2 Co-operative Group Work Rubric, and any other blackline masters you decide to use. 	<ul style="list-style-type: none"> • 75–80 min (including 25 min to plant seeds; 5 min per day for 2 or 3 weeks to record observations; 20 min to record and discuss results) 	<ul style="list-style-type: none"> • If possible, have students plant seeds at the beginning of the chapter to provide time for plants to grow. • Substitute foam egg cartons for the plant trays. Make sure to put a small hole in each to allow for drainage.

Materials Needed for Chapter 14

Activity/Investigation	Apparatus	Materials	Blackline Masters
<i>Test It! Which Laundry Detergent Cleans Better in Cold Water?</i> (page 298) (TR page 335)	<ul style="list-style-type: none"> large beakers or ice-cream pails thermometer measuring spoons 	<ul style="list-style-type: none"> 3 identical small squares of fabric 2 substances to stain fabric samples (e.g., mud, oil, mustard, ketchup, grape juice) 2 types of cold water laundry detergent ice to cool water 	Recommended OHT 8 Types of Variables OHT 12 Scientific Method OHT D-7 Which Laundry Detergent Cleans Better in Cold Water? Assessment Master 3 Lab Report Checklist Assessment Master 4 Lab Report Rubric Assessment Master 11 Fair Test Checklist Assessment Master 12 Fair Test Rubric
<i>Find Out: Homemade Hair Gel</i> (page 302) (TR page 337)	<ul style="list-style-type: none"> hot plate pot with two short handles or heat-proof beaker long-handled spoon (heat proof) strainer wide-mouth jar or heat-proof container with a lid 	<ul style="list-style-type: none"> 10 mL flax seeds 200 mL water cheesecloth lavender or other natural fragrance (optional) 	Recommended Master 1 Narrative Lab Report Optional BLM 1-1 Predict, Explain, Observe, Explain BLM 14-2 Homemade Hand Cream
<i>Try This!</i> (page 305) (TR page 339)	<ul style="list-style-type: none"> computers with Internet access LCD projector (optional) 		Recommended Master 2 Writing an Opinion Paragraph BLM Intro-4 I Found It on the Internet
<i>Find Out: How Does Commercial Fertilizer Compare With Organic Fertilizer?</i> (page 308) (TR page 343)	Per group: <ul style="list-style-type: none"> 3 seed trays 15 mL measuring spoon ruler grow light or bright, sunny window 	Per group: <ul style="list-style-type: none"> 27 radish seeds potting soil 3 wooden craft sticks permanent marker 10-10-10 pre-mixed liquid plant fertilizer fish emulsion organic fertilizer 	Recommended Assessment Master 4 Lab Report Rubric Assessment Master 2 Co-operative Group Work Rubric Optional Master 3 Centimetre Grid Paper BLM 3-4 Making a Bar Graph BLM 3-5 Making a Bar Graph in Microsoft® Excel

CHAPTER 14 Media and Care Products (page 296)

SUGGESTED TIMING

45 min

MATERIALS

- magazines advertising personal care products
- manila tag or similar poster-style paper
- scissors
- glue
- markers

BLACKLINE MASTERS

OHT D-2 Advertising Claims
OHT D-6 Unfinished Claim

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 terms:

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

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

Reading Icon Answer (page 297)

1. Students should underline: better than other cold water detergents.

Activity Planning Notes

In advance, gather magazines, including youth-oriented magazines that specifically advertise products to students.

Use **OHT D-2 Advertising Claims** and **OHT D-6 Unfinished Claim** to introduce and discuss the advertising claims presented in ads on pages 296 and 297.

Group students into teams of five—each student on a team should choose one type of advertising technique (i.e., scientific claim, testimonial, endorsement, weasel claim, unfinished claim). Ask each student to find two or three advertisements in magazines that they think fit into the category they chose. They

should discuss these with the other members of their team. Once everyone agrees on their choices, have each student cut out and glue their ads onto a piece of poster paper.

Have students present their labelled posters to the other members of their team before presenting them to the class. Consider creating a class collage using all of the posters.

Have students answer and then discuss the questions on page 297.

Note: In the Find Out activity on page 308, students plant seeds and measure their growth for a period of two to three weeks. Consider beginning the activity now to give seeds time to grow.

Check Your Understanding Answers (page 297)

2. a) someone about to do laundry
b) FreezieClean detergent is better than other cold water detergents.
3. No. The comparison with other detergents is not completed.

Making Connections Answers (page 297)

4. a) and b) Answers will vary depending on ads chosen. Ensure that students understand unfinished claims.

14.1 Clothing and Hair Care (page 298)

SUGGESTED TIMING

90–95 min including two Science
and Literacy Links
65 min for Test It!
50 min for Find Out
35 min for Try This!

MATERIALS

- several commercial detergents and hair gels
- Internet-ready computer and LCD projector
- computers with Internet access (optional)

BLACKLINE MASTERS

Master 1 Narrative Lab Report
Master 2 Writing an Opinion Paragraph
BLM Intro–4 I Found It on the Internet
BLM 1–1 Predict, Explain, Observe, Explain
BLM 14–1 Hazardous Household Product Symbols
BLM 14–2 Homemade Hand Cream
OHT 8 Types of Variables
OHT 12 Scientific Method
OHT D–7 Which Laundry Detergent Cleans Better in Cold Water?
Assessment Master 3 Lab Report Checklist
Assessment Master 4 Lab Report Rubric
Assessment Master 11 Fair Test Checklist
Assessment Master 12 Fair Test Rubric

Specific Expectations

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

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

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

Activity Planning Notes

Note that Chapter 14 focusses attention on potentially toxic chemicals found in personal care products. The goal is to make students better consumers by making them more aware of the chemicals found in these products and give them some tools to research the effects of such chemicals. To balance the approach, there is also a section about bias and an activity that clearly points out that much of the information on this topic is provided by biased web sites.

You might bring in some soaps and detergents to help discuss how these products

clean clothing. Include a discussion on the chemicals found in commercial detergents. Use this opportunity to review Hazardous Household Products Symbols with your students. Use **BLM 14–1 Hazardous Household Product Symbols** to reinforce the importance of reading the labels on all household chemicals. This blackline master ties in directly with the Science and Literacy Link on page 301.

Accommodations

- Pair ESL and LD Learners with students who have stronger language skills.
- Some students will benefit from handling and viewing examples of products to grasp the concepts. Showing video clips of commercials may help them learn and identify different types of advertising techniques.
- Have students who have difficulty writing discuss the answers orally.

Technology Links

- For information on chemicals in laundry detergent, go to www.mcgrawhill.ca/books/Se10 and follow the links to Laundry Alternative. Students should notice the bias in this web site that is selling alternative products. Ask them if the information is based on scientific facts.
- For information on homemade laundry soap, go to www.mcgrawhill.ca/books/Se10 and follow the links to Family Homestead.

After completing the Test It! activity, have students work individually or with a partner to read and complete the questions on page 301. You might refer students to the web sites recommended in the Technology Links on this page to help them.

You might bring in some commercially prepared hair gel products to introduce the Find Out activity on page 302. The focus of this activity is to make students aware of the chemicals that they may use on a daily basis. Hair gel is gender neutral and there is a simple recipe for making a comparable homemade product.

Pass some of the hair gels around and have students list all the chemicals found in these personal care products. After students complete the Find Out activity, have them read and discuss the health concerns of some of these chemicals on page 304.

As a class, discuss information and bias on page 305. Use **BLM Intro–4 I Found It on the Internet** to help students realize that information on the Internet is not necessarily based on well-supported facts.

You can help students recognize bias on web sites. For example, if you have access to an Internet-ready computer and LCD projector in your classroom, show students two or three web sites that have a strong bias. See the Technology Links for suggestions.

Have students complete the Try This! activity on page 305 as a follow-up to the discussion about bias.

Consider using the following blackline masters:

- **BLM Intro–4 I Found It on the Internet**
- **BLM 14–1 Hazardous Household Product Symbols**

Coming Clean About Detergents Answers (page 301)

1. Answers will vary. Students should identify three chemicals. Students may likely mention harmful effects of chemicals in detergents related to environmental impact and health risks for people who have allergies.

2. Answers may vary. Sample answer:

$\frac{1}{3}$ bar Fels Naptha soap

$\frac{1}{2}$ cup baking soda

$\frac{1}{2}$ cup borax powder

Grate the soap and put it in a pot. Add 1.5 L water and heat it until the soap melts. Add the baking soda and the borax and stir until dissolved. Remove from heat. Pour 1 L hot water into a heat-proof container. Add the soap mixture

and stir. Then add 5 L of water and stir. Let the soap cool for about 24 hours and it will gel. Use about $\frac{1}{2}$ cup per load of laundry.

Check Your Understanding Answers (page 301)

3. Examples will vary. Any ad that says that a product is better without saying how it is better or giving proof that it is better is an example of an unfinished advertising claim.
4. Answers may vary: Sample answer:
 - Consumers should analyze advertising claims so they don't waste money on poor quality products.

Making Connections Answers (page 301)

5. Answers will vary. Look for an example of each type of claim that meets the following criteria.
 - a) unfinished claim: does not give all the details of why a product is better
 - b) scientific claim: gives real (or sometimes bogus) scientific claims about a product

c) endorsement: is a testimonial given by a celebrity

d) weasel claim: sounds good but says nothing

Check Your Understanding Answers (page 305)

1. a personal judgment about something, which may or may not be based on well-supported facts
2. Answers may vary. Sample answers:
 - Knowing bias may help you determine if information is based on well-supported facts.
 - Knowing bias helps you determine and investigate the other sides of an issue.

Making Connections Answers (page 305)

3. a) No. Online stores want to sell more products.
- b) Yes. Government offices try to present judgements based on well-supported facts.
- c) No. Product makers want to sell as much of their product as possible.

Test It! Activity (page 298)

Which Laundry Detergent Cleans Better in Cold Water?

Purpose

- Students test the cleaning action of detergents in cold water.

Science Background

Laundry detergent helps get laundry cleaner. Detergents are soluble in water and dissolve oils and greases on clothing.

Most laundry detergents aren't soap. They are synthetics that are structurally related to natural soap. Actually, soap is a type of detergent. Detergents are a broad class of molecules that emulsify mixtures of oil and water.

Surfactants are a key ingredient in both solid and liquid laundry detergents. When a surfactant is added to water, it significantly reduces the surface tension of

the water. This allows water to wash surfaces better. Many different types of organic compounds can function as surfactants.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
5 to 6 days before	<ul style="list-style-type: none"> • Purchase two brands of cold water laundry detergent. • Obtain fabric samples. • Purchase substances to stain the fabric. • Ask students to bring in 4 L ice-cream pails (if needed). • Tape a TV laundry detergent ad.
1 day before	<ul style="list-style-type: none"> • Organize the materials. • Photocopy any assessment masters you decide to use.
Day of	<ul style="list-style-type: none"> • Set out materials.

APPARATUS	MATERIALS
<ul style="list-style-type: none"> • large beakers or ice-cream pails • thermometer • measuring spoons 	<ul style="list-style-type: none"> • 3 identical small squares of fabric • 2 substances to stain fabric samples (e.g., mud, oil, mustard, ketchup, grape juice) • 2 types of cold water laundry detergent • ice to cool water

Suggested Timing

65 min

Safety Precautions



- Remind students to wear gloves when handling detergent. Check for allergies to latex if you are using disposable latex gloves.
- Have students clean up the work area and wash their hands at the end of the investigation.

Activity Planning Notes

Cotton is a good choice of fabric. Polyester is known to hold on to stains. You might have a group test polyester and then compare their results with a group that tested cotton.

Organize students into teams of three or four students.

As a class, read the information on page 298 together. Encourage discussion to ensure that everyone understands what to do. Consider reviewing variables and the scientific method using **OHT 8 Types of Variables** and **OHT 12 Scientific Method** respectively. Use **OHT D-7 Which Laundry Detergent Cleans Better in Cold Water**, to help students plan their investigation.

Some students will struggle with how to plan a fair test (i.e., controlling all of the variables except how the two laundry detergents work). Consider providing **Assessment Master 11 Fair Test Checklist** to guide students in the development of the investigation.

Some students may struggle with how to determine the cleaning power of the detergents. Use the following prompts to help them:

- How will you know if your fabric sample is clean?
- What happens if both detergents do not get a stain completely out of the fabric? How will you determine which one did the better job?

Have students complete steps 1 to 5 on pages 298 and 299 to plan their test. Students should write their steps for step 6 on a separate piece of paper that you check before they begin.

Also, have students prepare a method for organizing and recording the data they collect before they begin.

Accommodations

- Students with physical or visual impairments could be teamed with those without such difficulties. Make sure that everyone in the group has a specific role in the investigation.
- Some students may have difficulty putting their steps in logical order. Have them write out the steps on one side of a piece of paper and then cut out the steps. They can rearrange the steps until they are in logical order, and then glue the steps in place in their student resource.
- Students who have difficulty writing could be paired with someone who can record their answers, or provide answers orally.

Test It! Activity Answers (pages 298–300)

3. manipulated variable: type of soap
4. a) responding variable: cleanliness
b) Answers will vary. Some may check the fabrics by eye after washing.
5. Encourage students to brainstorm several answers for each question. Let groups decide among themselves which methods to use.
6. Have students show you their procedure before they start.
7. Results will vary. Students may record their observations by collecting the fabric sample

they stained and washed using different brands of detergent. Encourage them to develop a method to organize the samples. For example, they could glue or staple them to a piece of paper on which they label the type of stain and brand of detergent.

8. Encourage students to provide supporting points for their choices.
9. Answers will vary. Encourage students to make connections between the advertising claims and the actual performance of detergents.
10. a) and b) Answers will vary.
 c) and d) Have students think of at least one improvement to their procedure. You might have students refer to **Assessment Master 11 Fair Test Checklist** to help them.
 e) Answers should reflect the idea that one test is not conclusive evidence to accuse a manufacturer of false advertising.

Activity Wrap-up

- Have groups share their observations of the investigation in a class discussion. Ask students how they could improve on their procedure. See if the class can reach consensus on the brand of detergent that performed the best.
- Have students complete question 10 on page 300. Have them discuss their answers with a peer and then the class.
- Show a video of one or more TV laundry detergent ads. Have students find evidence of testimonials, endorsements, scientific claims, or weasel claims used in the ads.

Find Out Activity (page 302)

Homemade Hair Gel

Purpose

- Students make homemade hair gel.

Science Background

Hair gel keeps hair in its place and allows for sculpting hair styles. The results it produces are usually stronger than those of hair spray and weaker than those of hair glue or hair wax.

Flax seeds are very rich in omega-3 oils, which are essential fatty acids important for health, including the health of skin and hair.

Most homemade recipes require refrigeration since they don't contain preservatives. Shelf life is approximately one week.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
5 to 6 days before	<ul style="list-style-type: none"> • Purchase flax seeds from local health food store. • Purchase other materials as required. • Purchase small gift jars.
1 or 2 days before	<ul style="list-style-type: none"> • Photocopy Master 1 Narrative Lab Report and any other blackline masters you decide to use.
Day of	<ul style="list-style-type: none"> • Set out materials.

APPARATUS	MATERIALS
<ul style="list-style-type: none"> • hot plate • pot with two short handles or heat-proof beaker • long-handled spoon (heat proof) • strainer • wide-mouth jar or heat-proof container with a lid 	<ul style="list-style-type: none"> • 10 mL flax seeds • 200 mL water • cheesecloth • lavender or other natural fragrance (optional)

Suggested Timing

50 min (including 20 min for cooking flax seeds; 30 min for cooling)

Safety Precautions



- Advise students that even natural products such as flax can result in allergic reactions. Do not let students with allergies to oil-based seeds do this activity.
- Remind students to be careful near heat.
- Remind students to pull on the cord, not the plug, when unplugging the hot plate.
- Remind students to let the mixture cool before applying it to their hair.
- Have students clean up the work area and wash their hands thoroughly at the end of the activity.

Activity Planning Notes

Group students into small groups to save on materials. Students may wish to make this product as a gift for a family member or friend.

As a class, read the directions. Encourage discussion to ensure that everyone knows what to do.

As you circulate, check that students are on task and using materials appropriately.

Straining the seeds from the gel can be problematic. You might have to adjust the timing a bit to ensure

that students do not burn their fingers, and the mixture is still runny enough to go through the cheesecloth and strainer.

Accommodations

- Use the Predict, Observe, and Explain technique to demonstrate the procedure. This will give students visual and auditory references for this activity. If so, have students complete **BLM 1–1 Predict, Explain, Observe, Explain**.
- Pair students with dexterity problems with those without such difficulties.

Find Out Activity Answers (page 303)

- Answers will vary. Sample answer:
Homemade Hair Gel Difference: less colourful; not as clear; does not keep well
Similarity: similar consistency
Commercial Hair Gel Difference: contains preservatives
- Answers will vary. Students could test ease of application and use, scent and appearance, or thickness of products.
- Refrigeration slows the growth of bacteria, which need warmer temperatures to grow.
 - After a week, the gel will be contaminated by bacteria and fungi. It may begin to smell or go mouldy.

Activity Wrap-up

- Have students complete and then discuss questions 8 to 10 on page 303. Caution that the homemade product does not contain preservatives. The gel should be refrigerated and then disposed of after one week.

Technology Links

- For more information on homemade personal care products, go to www.mcgrawhill.ca/books/Se10 and follow the links to The Dollar Stretcher. The web site provides recipes for a number of personal care products. Caution students about potential allergic reactions when making any homemade personal care product.

Alternative Activity

- If students are interested in other homemade personal care products, consider having them do the activity described on **BLM 14–2 Homemade Hand Cream**. You will need beeswax, mineral oil, and boric acid for the activity.

Try This! Activity (page 305)

Purpose

- Students explore web sites for information about chemicals in hair care products.
- Students analyze web sites for bias.

Science Background

Hair styling products can contain TEA, DEA, MEA, FD&C colours, BHA, and palmitate-O, which are all carcinogens. Ethoxylated alcohols, PEG compounds, and polysorbate 60 or 80 may be contaminated with 1, 4-dioxane, a carcinogen. Conventional hair sprays coat hair with polyvinylpyrrolidone (PVP), a plasticizer.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 weeks before	<ul style="list-style-type: none">• Book computers with Internet access.• Make bookmarks for web sites about chemicals in hair gels.
1 to 2 days before	<ul style="list-style-type: none">• Photocopy BLM Intro–4 I Found It on the Internet and Master 2 Writing an Opinion Paragraph.

APPARATUS	MATERIALS
<ul style="list-style-type: none">• computers with Internet access• LCD projector (optional)	

Suggested Timing

35 min

Activity Planning Notes

Many web sites are biased about the dangers associated with chemicals found in cosmetics and other personal care products. In advance, search for web sites that are reader-friendly for students and biased. Using key terms such as “toxic chemicals in cosmetics” on your favourite search engine will result in hundreds of web sites that provide opinions on the safety of hair care products. Some of these web sites are trying to sell alternative products. Create some bookmarks to save time.

Introduce the activity by using a computer connected to an LCD projector. Project a web site with a strong bias about hair gels on the screen and read and discuss the information with your students. Prompt them to find the bias.

Provide students with a copy of **BLM Intro–4 I Found It on the Internet**. Work with your students to analyze the web site that you are projecting. You may wish to repeat this activity by going to several web

sites. Prompt students:

- What is the bias?
- Is the judgment based on well-supported facts?
- Is more than one side of the issue presented?

Accommodations

- Consider doing this as a class-discussion activity rather than an individual student research project.

Technology Links

- For information on chemicals found in personal care products, go to **www.mcgrawhill.ca/books/Se10** and follow the links to Environmental Working Group. Please note that this is a very biased web site but does provide information on the chemicals in products.

Activity Wrap-up

- Have students write an opinion paragraph about the web site that they trust the most. Provide them with **Master 2 Writing an Opinion Paragraph**.
- Remind students that there are risks associated with homemade and commercially manufactured products. Reading the label and researching the potential side effects of chemicals used in these products are important steps in becoming wise consumers.

Ongoing Assessment

- Use questions 3 to 5 on page 301 to assess students' understanding of the importance of analyzing advertising claims.
- Consider using the following assessment masters to assess students' performances during the Test It! investigation.
 - Use **Assessment Master 4 Lab Report Rubric** to assess students' work.
 - Use **Assessment Master 12 Fair Test Rubric** to assess how well students met the criteria for a fair test.
- Assess the narrative lab reports that students wrote for the Find Out activity.
- Assess the opinion paragraph that students wrote for the Try This! activity for understanding of bias.

Technology Links

- For the Health Canada Guidelines for Cosmetic Advertising and Labelling Claims, go to **www.mcgrawhill.ca/books/Se10** and follow the links to Health Canada Guidelines. This web site provides a list of acceptable and unacceptable claims that can be made on cosmetics. Please note that this web site also lists Intimate Products. Caution is advised if you decide to print and distribute this information to students.
- For information about using cosmetics safely, go to **www.mcgrawhill.ca/books/Se10** and follow the links to It's Your Health.

Alternative Activity

- Have students use a computer and graphics software or pencil and paper to make a web page warning others of the potential dangers associated with using personal hair care products. Encourage them to be conscious of bias and to use facts to support their point of view.

14.2 How Does Your Garden Grow?

(page 306)

SUGGESTED TIMING

80 min including assigning the
Science and Literacy Link
75–80 min for Find Out

MATERIALS

- sample ads that use advertising techniques
- package of commercial 10-10-10 chemical plant fertilizer
- package or bottle of fish emulsion plant fertilizer
- computers with Internet access (optional)

BLACKLINE MASTERS

Master 3 Centimetre Grid Paper
BLM 3–4 Making a Bar Graph
BLM 3–5 Making a Bar Graph in
Microsoft® Excel
BLM 14–3 Plant Fertilizers
Assessment Master 2 Co-operative
Group Work Rubric
Assessment Master 4 Lab Report
Rubric
Assessment Master 5 Scientific
Communication Checklist
Assessment Master 6 Scientific
Communication 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

SIM2.01 – 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

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 these 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 Answer (page 306)

1. Students should highlight column 1 in the table.

Reading Icon Answer (page 307)

3. Students should write: 6 beside nitrogen; 12 beside phosphorus; 6 beside potassium.

Reading Icon Answer (page 308)

1. Multi-Gro Plant Fertilizer contains 27% more nutrients.

Reading Icon Answer (page 310)

1. Have students use one colour to highlight benefits and another colour to highlight drawbacks of manure in the table.

Reading Icon Answer (page 311)

2. Have students use one colour to highlight benefits and another colour to highlight drawbacks of commercial fertilizers in the table.

Accommodations

- Provide real-world ads targeted to young people for students to practise identifying advertising claims and advertising techniques.
- Have kinesthetic learners practise interpreting fertilizer labels to help them learn the concepts.
- 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 key terms.
- Allow students some choice in presenting their opinion for the Science and Literacy Link (e.g., prepare an oral report).
- Have students work in pairs or small groups.

Technology Links

- For information on Walkerton, go to www.mcgrawhill.ca/books/Se10 and follow the links to Inside Walkerton.

Activity Planning Notes

As a class, discuss the advertising techniques on page 306. You might provide some other examples of ads and have students identify the claim made and the advertising technique used.

Use the fertilizer package to discuss what the numbers mean. Discuss how each macronutrient in fertilizer helps plant growth before reading the information on page 307 as a class.

During the time that students are completing the Find Out activity on page 308, discuss the advantages and disadvantages of using manure and commercial chemical fertilizers on pages 310 and 311.

Read the Science and Literacy Link on page 310 together. Review the criteria for the written report. Discuss how students might gather information. In advance, gather print resources and book the computer lab.

You may wish to assign part of the activity as homework. If students do not have access to computers with Internet at home, provide print resources or time in class to do research online. Have students use **Assessment Master 5 Scientific Communication Checklist** to assess their report and suggest what changes might improve it before they hand it in.

Consider using the following blackline master:

- **Assessment Master 5 Scientific Communication Checklist**

Check Your Understanding Answers (page 306)

2. a) contains 27% more nutrients
b) your house plants will grow twice as big

Check Your Understanding Answers (page 307)

4. a) flower: potassium, nitrogen
b) leaves: phosphorus, nitrogen
c) fruit: nitrogen
d) stem: nitrogen
e) roots: phosphorus, nitrogen
5. Answers may vary. Look for one reason, such as:
- make plants grow better and stronger
 - produce more flowers
 - produce more vegetables

Write a Report Answers (page 310)

a) and b) Answers may vary. Students need to describe the key events in Walkerton and the steps taken to prevent similar tragedies. You might suggest students use a timeline for a).

Making Connections Answers (page 311)

3. and 4. Advertising claims will vary. Look for honest and accurate information.

Find Out Activity (page 308)

How Does Commercial Fertilizer Compare With Organic Fertilizer?

Purpose

- Students compare commercial fertilizer with organic fertilizer.

Science Background

Plants require certain nutrients in order to grow and reproduce. Nutrients are gradually depleted by plants. Other nutrients are lost to plants by the action of different types of bacteria in the soil. Fertilizers are used to replace the nutrients.

The three numbers on a fertilizer package refer to the amount of nitrogen, phosphorus, and potassium in the fertilizer. These nutrients are referred to as macronutrients. Plants require macronutrients in large quantities.

Nitrogen (N): part of chlorophyll molecules, which are responsible for photosynthesis. Plants use nitrogen to produce greener leaves and for general development.

Phosphate (P_2O_5): used for strong root and seedling development and to produce large fruit.

Potash (K_2O): used by plants for flower colour and size. It is also important for overall hardiness and increased resistance to disease.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 weeks before	• Purchase radish seeds, vermiculite, and seed trays.
1 to 2 days before	• Photocopy Assessment Master 4 Lab Report Rubric , Assessment Master 2 Co-operative Group Work Rubric , and any other blackline masters you decide to use.

APPARATUS	MATERIALS
Per group: <ul style="list-style-type: none"> • 3 seed trays • 15 mL measuring spoon • ruler • grow light or bright, sunny window 	Per group: <ul style="list-style-type: none"> • 27 radish seeds • potting soil • 3 wooden craft sticks • permanent marker • 10-10-10 pre-mixed liquid plant fertilizer • fish emulsion organic fertilizer

Suggested Timing

75–80 min (including 25 min to plant seeds; 5 min per day for 2 or 3 weeks to record observations; 20 min to record and discuss results)

Safety Precautions

- Remind students to unplug grow lights by pulling on the plug, not the cord.
- Have students clean up and wash their hands thoroughly at the end of the activity and each time they measure their plants.

Activity Planning Notes

If possible, have students plant seeds at the beginning of the chapter to provide time for plants to grow.

Substitute foam egg cartons for the plant trays. Make sure to put a small hole in each to allow for drainage.

You may wish to set up lab stations for different materials to reduce congestion. Have students take the materials they need to their workspace to improve traffic flow and reduce the potential for accidents.

As a class, read the directions and make sure that everyone understands what to do. Have students work in groups of three with each member of the group responsible for one treatment.

Have students plant two or three seeds in each well. Put the plant trays on boot trays so the moisture will not harm the surface beneath them. Once seeds have germinated, have students thin out the plants to reduce competition for nutrients. Consider keeping only one growing plant per well.

Water each tray of seeds with a different solution: plain water, fertilizer 1, and fertilizer 2. Ensure that each tray is labelled with the student's name and the treatment.

Over-watering plants will result in the plant suffocating and roots rotting. Students should use 2 to 3 tablespoons per well to start with and then adjust the amount of water added per well as the activity continues. Do not water with fertilizer solution each time; once a week is enough. Each well should receive the same amount of water (control).

Demonstrate measuring plant height and leaf size using a ruler. You could simply measure the length of the leaves or you could estimate the area of the leaves. Some students might be able to use the formula $A = \pi r^2$ to estimate the area of the leaves.

As you circulate, check that students are taking accurate measurements.

Have student make a bar graph to compare the average height of plants in the three seed trays. Provide students who need to review making a bar graph with **BLM 3–4 Making a Bar Graph**. Students who prefer using software might use **BLM 3–5 Making a Bar Graph in Microsoft® Excel**.

Accommodations

- Demonstrate the procedure for your students before they begin to help them visualize what they need to do to complete the activity.
- Students with dexterity problems could be teamed with those without such difficulties.
- Team students according to their skills and abilities. Make sure that each individual on the team has a

specific role or responsibility.

- Have more advanced students draw a line graph of the height of the plants versus days since planting.
- Provide students who need more space to record their graph with **Master 3 Centimetre Grid Paper**.

Find Out Activity Answers (page 309)

5. Data will vary. Check for accuracy in taking measurements.
6. Graphs will vary. The x -axis should be labelled “Treatment” and the y -axis should be labelled “Average Height of Plants.”
7. a) and b) Answers will vary depending on the treatments.
8. The tallest plants and those with the largest leaves were fertilized the best. Students can make a concluding statement about which fertilizer produced the best growth.
9. Answers will vary. For example, if the fertilized plants grew twice as big as the unfertilized plants, then the claim is truthful. Although students cannot determine if a fertilizer contains 27% more nutrients, they do know if they take pride in being a great gardener!

Alternative Activities

- Have students complete **BLM 14–3 Plant Fertilizers** to compare the growth of well-established house plants.
- Challenge students to research and then share their findings about the safety of using sewage sludge as fertilizer. Have them identify the bias on a web site they research and assess how well the facts are supported.
- Use some or all of the activities in the following *Life Science ActiveFolders*: Plants.

Ongoing Assessment

- Use **Assessment Master 4 Lab Report Rubric** to assess the quality of students’ work during the Find Out activity.
- Use **Assessment Master 6 Scientific Communication Rubric** to assess students’ reports for the Science and Literacy Link.

Technology Links

- For information about plant nutrients, go to www.mcgrawhill.ca/books/Se10 and follow the links to Plant Nutrients.
- For information about fertilizer, go to www.mcgrawhill.ca/books/Se10 and follow the links to Fertilizer.
- For information on using sewage sludge as fertilizer, go to www.mcgrawhill.ca/books/Se10 and follow the links to Sewage Sludge.
- For information on algae blooms, go to www.mcgrawhill.ca/books/Se10 and follow the links to Building a Bloom. This web site discusses algal blooms and provides a hands-on activity for students.

Chapter 14 Review (page 312)

SUGGESTED TIMING

30–45 min to complete and take up the review, and then assign the Practice Test

BLACKLINE MASTERS

Master 5 Certificate
Master 6 List of Skills
BLM 14–4 Chapter 14 Practice Test
BLM 14–5 Chapter 14 Test
BLM 14–6 BLM Answers

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 14–4 Chapter 14 Practice Test** can be customized to produce extra reinforcement questions.

Summative Assessment

- Have students complete **BLM 14–5 Chapter 14 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**.

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 14–4 Chapter 14 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	Chapter Opener	Advertising Techniques (page 296)
2	Chapter Opener	Advertising Techniques (page 296)
3	Chapter Opener	Advertising Techniques (page 296)
4	Chapter Opener	Advertising Techniques (page 296)
5	Chapter Opener	Advertising Techniques (page 296)
6	Chapter Opener 14.1	Advertising Techniques (page 296) Clothing and Hair Care (page 298)
7	Chapter Opener	Advertising Techniques (page 296)
8	Chapter Opener	Advertising Techniques (page 296)
9	14.2	Commercial Chemical Fertilizers (page 311)
10	14.2	Commercial Chemical Fertilizers (page 311)
11	14.2	Manure Technology (page 310) Commercial Chemical Fertilizers (page 311)

Chapter 14 Review Answers (pages 312–313)

1. e) unfinished claim
2. b) testimonial
3. c) weasel claim
4. a) endorsement
5. d) scientific or statistical claim
6. a) F. A doctor advertising medicine on TV may actually be an actor.
b) F. A fair test has one manipulated variable and one or more responding variables.
c) F. It is important to control all of the variables when conducting an experiment.
d) T
7. The word “fights” is an example of a weasel claim. The claim does not say that the toothpaste conquers tooth decay.
8. a) eight out of ten doctors recommend
b) This is a scientific claim.
c) Answers will vary. Instant relief could mean that the medication relieves pain immediately.
9. a) and b) Answers may vary. Sample answers:
 - The fertilizer can run off into the sewer system or into a stream.
 - People may apply more fertilizer when they observe that it doesn’t seem to be working.

10. Answers will vary. Sample answer:

- The directions tell you how much of a product to use and how much to dilute it (if necessary). Following the directions protects your health and safety.
11. a) Benefits: both add nutrients to the soil
b) and c) Manure Drawbacks: requires careful management; must be stored to prevent bacteria and nutrients from seeping into ground water; a large volume is required; bacteria from stored piles can seep into ground water and contaminate the water
d) and e) Commercial Fertilizer Drawbacks: large amounts of energy are needed for its manufacture; any that runs off into streams can promote the growth of algae; using too much kills plants

Unit D Task: Frequently Asked Questions About Tobacco and Health

(pages 314–315)

SUGGESTED TIMING

4 – 1 hour classes (1 h to research and complete the What Did You Discover? questions, 1 h to storyboard and plan presentations, 1 h to create presentations, 1 h to present presentations to the class)

Note: You may need up to an additional hour if your students are not familiar with using software programs.

MATERIALS

- computers with Internet access
- small index cards

BLACKLINE MASTERS

BLM Intro—4 I Found It on the Internet
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

SIM2.03 – interpret research data, including analysis for accuracy and bias as appropriate, using a range of strategies for reading for information

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

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

Activity Planning Notes

Review the school's computer policy with students before allowing them access to the Internet. Reinforce the purpose of their Internet search. You may wish to brainstorm ways they can use a search engine to find the information requested on page 314. Alternatively, students could underline the key words in each question and use these as search words.

Although students are encouraged to use an approved Internet search engine, you could save time by bookmarking the Canadian Lung Association web site. It has all of the information students need to complete their research. See the Technology Link on page 350.

Once students have found the answers to the 10 questions, discuss with the class how this information might help Grade 7 students understand how they are targeted by tobacco companies. Discuss how students might develop a presentation for these students as part of their final assessment.

Provide students with a copy of **Assessment Master 15 Visual Presentation Checklist** and **Assessment Master 16 Visual Presentation Rubric** before they start designing their presentation. Walk students through each section of the checklist and rubric. This will tell the students exactly what you will be looking for when you assess their presentations. It also provides them with tools to help organize and design their presentation.

Have students work in pairs. Students should make a story board of their presentation before trying to build a slide show presentation using computer software, such as PowerPoint™. Use the index cards to represent each slide in their presentation. Have students write out the information that they want to include on each slide and put the cards in order. Remind them that a slide show presentation is designed to provide key statements, not long paragraphs. The presentation should also be visually appealing. Students should also check that the font, as well as its size and colour, should stand out from the background of their slide.

Accommodations

- Bookmarking the Canadian Lung Association web site will save time. You could also lead the discussion by using a single computer connected to an LCD projector in your classroom. You could read the information with the students and then point out the answers to the What Did You Discover? questions on pages 314 and 315.

What Did You Discover? Answers (pages 314–315)

- a) About 4000 chemicals are found in tobacco.
 - b) Many of the chemicals are cancer-causing.
 - c) Nicotine is the most addictive.
3. No. Smoking kills one half of the people who use it. Smoking is the number one cause of cancer. “Light” cigarettes have a lighter taste because of air holes, but the tobacco has the same chemicals in the same concentrations.
4. Look for six of the following points:
 - Smoke kills the hairs in the lungs which normally carry particles from the lungs.
 - Smoke permanently damages the air sacs in the lungs.
 - Smoking can cause:
 - several types of cancer
 - heart disease
 - sleeping problems
 - pneumonia
 - emphysema
 - stomach ulcers
 - high blood pressure
 - osteoporosis
 - gum disease
5. Smoker’s cough happens because of the damage to the lungs (see question 4 above).
6. Yes, the chemicals from the smoke get into the pregnant woman’s blood and from there into the fetus’s blood. Smokers often have premature or lighter-weight babies than non-smokers.
7. Yes. More women are smoking now than before, and the incidence of lung cancer is rising in women.
8. The dangers of second-hand smoke are the same as the dangers of smoking. It is the number two cause of cancer.
9. No, chewing tobacco and taking snuff are just as dangerous as smoking. They can cause lip and mouth cancers, as well as affect the heart and circulation.
10. The tobacco industry targets teenagers because they want to sell their products. If they can get teens to start smoking, they may be able to sell them cigarettes for the rest of their lives. Many actors smoke on TV and in movies because of “product placement” (see Chapter 13). Teens watching these shows may see their favourite actors, and think that smoking is cool. Advertisers also try to show that smoking is an adult activity, and teens want to pretend to be adult.

Making Connections Answer (page 315)

11. Presentations will vary. Ensure that the students have looked at and analyzed tobacco advertising, and not just listed or researched smoking risks.

Summative Assessment

- Use **Assessment Master 16 Visual Presentation Rubric** to assist you in assessing student work on this task. You may have to modify this rubric if you are assigning something other than the slide show presentation.

Technology Links

- For more information on smoking and tobacco, go to **www.mcgrawhill.ca/books/Se10** and follow the links to the Canadian Lung Association. This is the introduction to the area on smoking and tobacco. Links are provided to topics such as What Is in a Cigarette? and Teens and Smoking.
- For more information on PowerPoint™ presentations, go to **www.mcgrawhill.ca/books/Se10** and follow the links to PowerPoint™ in the Classroom.
- For information on PowerPoint™ tutorials, go to **www.mcgrawhill.ca/books/Se10** and follow the links to Creating Classroom Presentations.

Alternative Activities

- Students without computer access could use old magazines to make a collage of images that carry the same message about the dangers of smoking.
- Students could design their own poster and use card stock and markers to tell their story.
- Students could write and perform a short skit or play about why teens smoke and the dangers associated with smoking. You could take this even further by having the students video the skit/play and show it (after you have previewed it) to the rest of the class.