

Activity Preparation for Chapter 12

Activity/Investigation	Advance Preparation	Time Required	Other Considerations
<i>Find Out: Endangered Species in Ontario</i> (page 257) (TR page 286)	<ul style="list-style-type: none"> • 2 to 3 weeks before <ul style="list-style-type: none"> – Collect samples of posters and web pages that feature endangered species. • 1 week before <ul style="list-style-type: none"> – Book the library or computer lab. • 1 day before <ul style="list-style-type: none"> – Familiarize yourself with the web site students will use. – Photocopy Assessment Master 15 Visual Presentation Checklist and Assessment Master 16 Visual Presentation Rubric. • Day of <ul style="list-style-type: none"> – Set out materials. 	<ul style="list-style-type: none"> • 55–65 min includes research and preparation of visual presentation 	<ul style="list-style-type: none"> • Check out web sites for samples of visual presentations. Look for samples that highlight appealing features (e.g., facts in a sidebar, pictures) and less appealing features (e.g., too much descriptive text).
<i>Find Out: Role-Play a Press Conference</i> (page 258) (TR page 287)	<ul style="list-style-type: none"> • 1 week before <ul style="list-style-type: none"> – Book the library or computer lab. • 1 day before <ul style="list-style-type: none"> – Familiarize yourself with useful web links for students. • Photocopy BLM 12–1 Role-Play a Press Conference and any assessment masters you plan to use. 	<ul style="list-style-type: none"> • 60–75 min includes research and preparation, and role-play 	<ul style="list-style-type: none"> • In advance, familiarize yourself with web sites about caribou and habitat loss due to logging.
<i>Try This!</i> (page 263) (TR page 291)	<ul style="list-style-type: none"> • 1 or 2 weeks before <ul style="list-style-type: none"> – Book the computer lab (optional). – Gather information about local environmental groups. 	<ul style="list-style-type: none"> • 30–45 min 	<ul style="list-style-type: none"> • In advance, decide if students will research local environmental groups or if you will provide information about local groups. You may need to book the computer lab in the former case. In the latter case, gather information about local groups.
<i>Try This!</i> (page 263) (TR page 292)	<ul style="list-style-type: none"> • Several weeks before <ul style="list-style-type: none"> – Check with the municipality for permission to paint. – Contact the Yellow Fish Road™ Program to order painting kits. – Book the computer lab (optional). – Arrange a painting day. • 1 day before <ul style="list-style-type: none"> – Familiarize yourself with the program. – Photocopy Assessment Master 2 Cooperative Group Work Rubric. • Day of <ul style="list-style-type: none"> – Set out painting kits. 	<ul style="list-style-type: none"> • 10–15 min in class; time for painting depends on the scope of project 	<ul style="list-style-type: none"> • In advance, consult the municipality for permission to paint and recommended locations. Choose a location away from traffic and preferably close to the school. • Ask adult volunteers to help monitor the activity. • Sign up for the program using the web site. The program guide lists partners in Ontario. If one of the Yellow Fish Road™ partners is close to you, contact them directly to borrow complete painting kits. If you are not near any partners, contact Trout Unlimited directly.
<i>Find Out: Compare Packaging</i> (page 264) (TR page 294)	<ul style="list-style-type: none"> • 2 or 3 days before <ul style="list-style-type: none"> – Have students bring a product in its original packaging to school. – Have on hand a few products with considerable amounts of packaging. • 1 day before <ul style="list-style-type: none"> – Photocopy Assessment Master 17 Narrative Lab Report Checklist. • Day of <ul style="list-style-type: none"> – Set out materials. 	<ul style="list-style-type: none"> • 30–45 min 	<ul style="list-style-type: none"> • One or two digital balances are adequate for the entire class.

Materials Needed for Chapter 12

Activity/Investigation	Apparatus	Materials	Blackline Masters
<i>Find Out: Endangered Species in Ontario</i> (page 257) (TR page 286)	<ul style="list-style-type: none"> coloured pencils scissors glue 	<ul style="list-style-type: none"> poster paper 	Recommended Assessment Master 15 Visual Presentation Checklist Assessment Master 16 Visual Presentation Rubric
<i>Find Out: Role-Play a Press Conference</i> (page 258) (TR page 287)			Recommended BLM 12–1 Role-Play a Press Conference Assessment Master 13 Oral Presentation Checklist Assessment Master 14 Oral Presentation Rubric
<i>Try This!</i> (page 263) (TR page 292)	<ul style="list-style-type: none"> painting kits Note: Painting kits include all safety and clean-up equipment.		Recommended Assessment Master 2 Co-operative Group Work Rubric
<i>Find Out: Compare Packaging</i> (page 264) (TR page 294)	<ul style="list-style-type: none"> scale or balance products from home 		Recommended OHT C–14 Compare Packaging Assessment Master 17 Narrative Lab Report Checklist

CHAPTER 12 Human Impact on Communities

(page 250)

SUGGESTED TIMING

15–20 min

Overall Expectations

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

BLTV.03 – analyse the challenges that arise from organisms living in communities

Science Background

Wolves are top predators and prey on animals that range from moose to squirrels and other rodents. Although they are wary of humans, if hungry, wolves will prey on livestock and forage for food in garbage.

The data presented on page 250 is based on the wolf population in Algonquin Park because the studies are well-documented.

There were 130 000 wolves in Ontario 100 years ago. There are about 7000 wolves in Ontario today. Ontario wolves are less healthy today than they were 100 years ago. They are at greater risk for disease and some scientists have doubts about their long-term chances of survival.

Activity Planning Notes

Have students share what they know about wolves. Be sensitive to different student perspectives. For example, some students may have family members who are hunters. Nurture respect for different points of view and avoid being overly critical of local practices.

When discussing what wolves eat, you might review the food chain that ends with the wolf found on page 242 in the student resource.

As a class, read the web page together. Afterward pose discussion prompts such as:

- Whose point of view is presented?
- What is the wolf's point of view about wolf communities? What arguments support his opinion?
- Identify the ways in which the scientific information is presented (e.g., graph, statistics, expert testimony, example).
- Who is the target audience? Explain.

Have students complete and then discuss question 1. Stress the importance of respecting the opinions of others before asking students if wolf communities are

at risk. Ask what else students need to know before answering this question. Reinforce the importance of doing research to check on information provided in a media piece.

Check Your Understanding Answers (page 250)

1. Look for one example for each kind of evidence.

Sample answers:

a) Expert testimony; Canada's senior wolf research biologist

b) Fact; graph of Algonquin Park wolf population

c) Statistic; only 3% of wolves protected by new regulations

Alternative Activity

- Assign students different roles including members of a wolf pack, prey, and human, and role-play the different perspectives on the wolves' situation. Or, have a mock trial in which a human is put on trial by the wolves for upsetting the balance in the food chain.

12.1 Human Impact (page 251)

SUGGESTED TIMING

45–50 min (including the Science and Literacy Link)

Specific Expectations

BLT1.02 – identify challenges that arise from organisms living together in communities, including human populations

BLT1.04 – use appropriate scientific terminology related to concepts of organisms living together

BLT3.02 – determine, through a case study, and explain how humans organize their communities to address challenges of living together

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

Science Background

When birds have high levels of salt, the toxic effects result in behavior change. One result is a loss of fear, which makes birds less likely to flee at the approach of humans and vehicles. Partial paralysis may also set in. It is not known whether the loss of fear is entirely due to salt intoxication or to extreme salt hunger, but the behavior change is the same.

Technology Links

- For information about the harmful effects of pesticides, go to www.mcgrawhill.ca/books/Se10 and follow the links to Get Your Garden Off Chemicals.

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.
- List a number of animal or plant species on the chalkboard and ask students to identify them as either exotic or native.
- Discuss examples of native and exotic species from students' own experience.

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

Reading Icon Answer (page 251)

- Students should highlight: clearing trees from a forest, forestry, farming, competition from starlings for nests, and crowd out native species.

Reading Icon Answer (page 253)

- Students should underline chemicals that control or kill organisms.

Activity Planning Notes

Students may have little awareness of how human activities affect the environment. Help them understand that there are benefits and costs to forestry and farming practices, land development, and using salt and pesticides. Emphasize the importance of weighing the benefits and costs when people decide to create change in an ecosystem.

As a class, read page 251 together. Discuss other examples of the results of habitat loss in Ontario such as the increase in sightings of skunks and raccoons in urban areas as a result of expanding towns, and the decrease in the Massasauga rattlesnake population as a result of expanding towns and roads.

Discuss other examples of introduced species in Ontario, such as:

- The sea lamprey, an eel-like fish, moved through the St Lawrence to the Great Lakes after the Welland Canal was completed. Sea lamprey feed by attaching themselves to fish and sucking on their blood. The fish die.
- Zebra mussels are shellfish that were brought to the Great Lakes by boats. Zebra mussel colonies have spread quickly and clog water intake lines, cover boat hulls, kill clams, and disturb lake ecosystems.

After reading about road salt and pesticides on pages 252 and 253, discuss practical uses of an herbicide and insecticide, such as:

- Plants such as dandelions compete with grass for water and nutrients. People use herbicides on their lawns to kill dandelions.
- The Colorado potato beetle is the worst insect pest of potatoes. Farmers control it mostly using insecticides.

Accommodations

- Pair ESL and LD Learners with those who have stronger language skills.
- Pair students who have difficulty writing with those who can help record their answers. Alternatively, have them present answers orally.

Ask students what advice they would give and why for each of the following situations:

- introducing live bait fish that are not natural to a lake to catch other fish
- dumping soapy water into streams or lakes when camping
- spraying pesticides on plants close to rivers or streams

Introduce the case study on page 254 by telling students that some Ontario municipalities have banned pesticides or will ban them in the near future.

Check Your Understanding Answers (page 252)

1. a) Small organisms such as tadpoles may become dehydrated if they are in water that contains high levels of salt.
b) Salt can kill trees such as willows that need a large amount of water to survive.
c) Salt may poison birds directly, and it also changes bird behaviour. Birds lose their fear of highway traffic.

Making Connections Answer (page 253)

3. Wording will vary. Look for the idea that traces of pesticides can accumulate in the food chain.
Sample answer:
 - Each organism in the hawk's food chain can be contaminated with herbicides. Hawks eat mice

that eat grasshoppers that eat grass treated with herbicides. Traces of herbicides are stored in each organism's body.

Check Your Understanding Answers (page 254)

1. For a) to e), look for five of the following actions:
 - tell people about the environmental impacts of pesticide use in gardens
 - provide people with information to use non-toxic methods of pest control
 - encourage neighbourhood discussion about pesticide use and alternatives
 - door-to-door pledge
 - offer workshops
 - talk to local businesses about stocking organic products
 - presentations to Town Council

Alternative Activities

- Have students work with a partner to find out the by-laws on the use of pesticides where they live. Have them present their findings orally.
 - Have students interview a school custodian in class and find out how weeds and pests are controlled at school. In advance, have students develop questions (e.g., products used; frequency of use; safety precautions in place). Remind students that the custodian's role is to carry out school board policy, not form it. Students may not need to know the precise chemicals used to control weeds or pests, but they should be able to identify trade names. You might have students use trade names to research the effects of the chemicals they contain. Many schools use fairly toxic chemicals to control weeds and pests. Have students share their findings.
- If students want to engage in action, have them research alternatives to using pesticides on lawns. Student might write a letter to the school board that addresses the following questions:
- Why should schools avoid using pesticides?
 - What alternatives do you recommend?

Ongoing Assessment

- Use question 1 on page 252 and question 3 on page 253 to assess student understanding of how salt and pesticides harm organisms.

Technology Links

- For information about a Pesticide Free Action Kit, go to www.mcgrawhill.ca/books/Se10 and follow the links to Green Communities Canada.
- For information about alternatives to pesticide use on lawns, go to www.mcgrawhill.ca/books/Se10 and follow the links to 10 Steps to Non-Toxic Lawn Care.

12.2 Endangered Species (page 255)

SUGGESTED TIMING

20–30 min (including the Science and Media Link)

55–65 min includes research and preparation of visual presentation for Find Out: Endangered Species in Ontario

60–75 min includes research and preparation, and role play for Find Out: Role-Play a Press Conference

MATERIALS

- chart paper and markers

BLACKLINE MASTERS

BLM 12–1 Role-Play a Press Conference

OHT C–12 Endangered Species Ad Assessment Master 13 Oral Presentation Checklist

Assessment Master 14 Oral Presentation Rubric

Assessment Master 15 Visual Presentation Checklist

Assessment Master 16 Visual Presentation Rubric

Specific Expectations

BLT1.02 – identify challenges that arise from organisms living together in communities, including human populations

BLT1.04 – use appropriate scientific terminology related to concepts of organisms living together

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

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

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

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 sentence using the two key terms that shows understanding of their meaning.

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

Reading Icon Answer (page 255)

2. Students should highlight: extinct species, endangered species, and threatened species.

Activity Planning Notes

After reading about species at risk on page 255, write the names of some threatened, endangered, and extinct species on the chalkboard or on chart paper. Describe briefly the history of each animal and plant species, and project images of each one onto a TV screen, if available. Then ask students to identify each species as threatened, endangered, or extinct.

Discuss other examples of species at risk in Canada. For example, Elk Island National Park was established in 1906 by the near extinction of the Plains buffalo and other wildlife species such as the elk. This was Canada's first federal wildlife sanctuary for large mammals.

Ask students about any local endangered or threatened species.

Have students complete and then discuss questions 3 and 4 on page 255, before analyzing the ad on page 256.

Read the ad and the questions as a class. Be prepared to expand on questions. For example, for question 1. b), look back at page 250 for different kinds of evidence; for question 3, think about format features (e.g., graph, chart, statistic, visual).

As you circulate, coach students who experience difficulty with answering the questions. The ad can be used as a lead-in to the two Find Out activities that follow.

Consider using the following overhead transparency:

- **OHT C–12 Endangered Species Ad**

Accommodations

- Pair ESL and LD Learners with students who have stronger language skills.
- Have students who have difficulty writing discuss the answers orally.
- Some students may need additional reinforcement to process the information and the instructions for analyzing the ad. Alternatively, such students could be paired with those who have stronger skills.

Check Your Understanding Answers (page 255)

3. a) endangered species
b) threatened species

Making Connections Answer (page 255)

4. Sample answer:
 - When the predator population disappears, the deer population may increase. An increased deer population may result in fewer plants having a chance to regrow. This may reduce the plant population.

Analyzing an Endangered Species Ad Sample Answers (page 256)

1. a) There are many species at risk worldwide.
b) The ad lists facts that include statistics based on scientific research.
2. The ad targets individuals to find out what they can do to help save species.
3. The ad uses appealing visuals of species at risk and an easy to follow checklist.

Find Out Activity (page 257)

Endangered Species in Ontario

Purpose

- Students research an endangered species in Ontario and present their information visually.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 to 3 weeks before	<ul style="list-style-type: none">• Collect samples of posters and web pages that feature endangered species.
1 week before	<ul style="list-style-type: none">• Book the library or computer lab.
1 day before	<ul style="list-style-type: none">• Familiarize yourself with the web site students will use.• Photocopy Assessment Master 15 Visual Presentation Checklist and Assessment Master 16 Visual Presentation Rubric.• Set out materials.

APPARATUS	MATERIALS
<ul style="list-style-type: none">• coloured pencils• scissors• glue	<ul style="list-style-type: none">• poster paper

Suggested Timing

55–65 min includes research and preparation of visual presentation

Activity Planning Notes

Check out some web sites for samples of visual presentations. For example, you might show students

part of the web page about marmots provided in the Technology Link and highlight appealing features (e.g., facts in a sidebar, pictures) and less appealing features (e.g., too much descriptive text).

As a class, read page 257. Ask students to get your approval for a species they choose. In this way, you can ensure a diversity of animal and plant species.

Allow time for students to do research. Then distribute **Assessment Master 15 Visual Presentation Checklist** and review the criteria for the visual presentation. Tell students to use question 3 as a guide for content to include. The message should focus on protecting the species at risk. Alternatively, consider providing class time for research and then assigning the presentation as a homework project.

Display the completed presentations in the classroom.

Accommodations

- Display some sample posters and web pages.
- Pair ESL and LD Learners with students who have stronger language skills.
- If students have access to a computer, they may wish to use clip art and graphics software to create their presentation. The zoom feature on most photocopiers can be used to enlarge images to poster size.
- Provide students who need more space to record their research with a separate piece of paper. Remind them to put their name on it.

Activity Wrap-up

- Have students share their presentations with the class and highlight the ways they conveyed scientific information to the audience.

Technology Links

- For a sample web page that features the marmot, go to www.mcgrawhill.ca/books/Se10 and follow the links to The Marmot: Canada's Most Endangered Mammal.

Find Out Activity (page 258)

Role-Play a Press Conference

Purpose

- Students take on the role of an interest group and conduct research to support their opinion.
- Students role-play a press conference about a threatened species.

Science Background

Ontario's woodland caribou live in the province's boreal forest and are listed as threatened by the Committee on the Status of Endangered Wildlife in Canada. This is due to loss of habitat. Caribou are dependent on large tracts of old undisturbed forest, which is disappearing as a result of industrial, clearcut logging.

Once a species is designated as threatened, the Ontario government has a responsibility to develop a recovery plan to prevent a further decrease in population as a result of human activity. However, protecting the caribou and the forest ecosystem on which they depend needs to be counterbalanced with the government's interests in maintaining industrial logging. Logging companies are required to replant in areas that they harvest, but it will be many years before clearcut areas are again reforested. By that time, the caribou may have disappeared from many areas.

Technology Links

- For information about Ontario's threatened caribou, go to www.mcgrawhill.ca/books/Se10 and follow the links to Boreal Forest.
- For information about facilitating a debate about a threatened species, go to www.mcgrawhill.ca/books/Se10 and follow the links to WebQuest.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
1 week before	<ul style="list-style-type: none">• Book the library or the computer lab.
1 day before	<ul style="list-style-type: none">• Familiarize yourself with useful web links for students.• Photocopy BLM 12–1 Role-Play a Press Conference and any assessment masters you plan to use.

Suggested Timing

60–75 min includes research and preparation, and role play

Activity Planning Notes

In advance, book the computer lab and familiarize yourself with web sites about caribou and habitat loss due to logging.

Read pages 258 and 259 together. Review the roles and positions about protecting caribou habitat and harvesting timber. Divide students into small groups and assign a role to each one. Distribute **BLM 12–1 Role-Play a Press Conference** for students to record information that supports their point of view. Provide students with the web sites you researched and encourage them to use key words such as woodland caribou, logging, and habitat loss to find related sites.

Allow time for students to do research before planning and role-playing the press conference. Consider having students complete the blackline master for homework and then practise the presentation during the next class.

Use **Assessment Master 13 Oral Presentation Checklist** to help review the criteria for an oral presentation.

Accommodations

- Help students take appropriate roles. Students who have difficulty speaking in a public forum can gather and record information.
- Some students may require assistance with research and planning techniques. Pair students with complementary skills.
- Pair students who have difficulties using computers with those who are particularly knowledgeable.
- Pair students who have difficulty writing with those who can help record their answers.

Find Out Activity Answers (page 259)

6. Answers will vary. Sample answer:

- There are different and valid points of view about protecting the caribou. It's important to keep jobs for people who live near boreal forests. It is also important to protect habitat for caribou. People need to work together to find a way to manage timber harvesting to protect the caribou and people.

7. Opinions may vary. Look for at least two supporting points. Sample answer:

In this case, the price of progress is not worth the cost to the environment.

- Old-growth forests will become even scarcer if uncontrolled development continues into previously undisturbed areas. If development continues at its current pace, caribou could become extinct in Ontario.
- It is important to conserve old-growth forest because it provides habitat for many other species besides caribou. A threatened species such as caribou affects other species in the food chain, which in turn affect the boreal forest ecosystem.

Activity Wrap-up

- Have students perform the role play. After, discuss the different points of view. Ask:
 - Which point of view might you support? Provide a reason for your support.
 - Which point of view might you reject? Provide a reason for your lack of support.
 - What are the most important facts you would keep in mind if you had to make a decision about a threatened species such as caribou?
- As a class, summarize students' overall values about protecting endangered species and managing the timber industry.

Ongoing Assessment

- Use **Assessment Master 16 Visual Presentation Rubric** to assess students' visual presentations for Find Out: Endangered Species.
- Use **Assessment Master 14 Oral Presentation Rubric** to assess students' oral presentations during Find Out: Role-Play a Press Conference.

Alternative Activity

- Have students search magazines or the Internet for an ad about endangered species. Have them analyze the ad.
 - What scientific information is presented?
 - How accurate is the scientific information? List two questions you want answered before you decide.
 - Who is the audience?
 - What techniques does the ad use to attract attention?Have students share the ad and their analysis with the class.

12.3 Concerns and Solutions (page 260)

SUGGESTED TIMING

75–90 min (including 20–25 min for Science and Literacy Link Case Study and 40–45 min for Science and Literacy Link Develop an Action Plan)
30–45 min for first Try This! on page 279
10–15 min in class; time for painting depends on the scope of the project for second Try This! on page 279
30–45 min for Find Out: Compare Packaging

MATERIALS

- sample poster about recyclables

BLACKLINE MASTERS

Master 1 Narrative Lab Report
BLM 12–2 Analyze Ads
BLM 12–3 Case Study: Two Islands
OHT C–13 Second-Hand Smoke Ad
OHT C–14 Compare Packaging Assessment Master 2 Co-operative Group Work Rubric
Assessment Master 17 Narrative Lab Report Checklist

Specific Expectations

- BLT1.02** – identify challenges that arise from organisms living together in communities, including human populations
BLT1.04 – use appropriate scientific terminology related to concepts of organisms living together
BLT2.06 – explain and interpret observations by summarizing patterns obtained from graphing data, organizing information, and communicating orally and in writing
BLT3.01 – develop a simple action plan, using a consistent written format, to address an environmental concern
BLT3.02 – determine, through a case study, and explain how humans organize their communities to address challenges of living together
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
SIM2.02 – research science-related information from a variety of electronic and other sources
SIM2.04 – organize and communicate information collected from lab investigations and information research using graphic organizers

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 using the key terms that shows understanding of their meaning.

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

Reading Icon Answers (page 260)

1. Answers will vary. Look for two facts about the effects of pollution, such as:
 - a) Smog affects the ability of people such as seniors, children, and those with asthma to breathe.
 - b) Too much phosphate in streams and lakes causes blue algae to grow, which pollutes water.

Reading Icon Answer (page 261)

1. Students could highlight: anti-smoking campaign, started a group, identify goals, develop an action plan, displayed posters, organized a school assembly, getting the facts, and using media.

Reading Icon Answers (page 262)

1. Answers will depend on local recycling program. For example, in Toronto:
 - plastic food jars, tubs and lids; plastic bottles and jugs; milk/juice cartons; empty paint and aerosol cans; metal cans; glass bottles and jars; aluminum rigid trays and pie plates; drink boxes; household paper; paper gift wrap and cards; paper egg cartons, rolls, and bags; boxboard boxes; newspapers and telephone directories; magazines, catalogues, and books; and corrugated cardboard
2. Students should highlight reduce, re-use, and recycle.

Activity Planning Notes

As a class, read and discuss pollution on pages 260 and 261. Consider asking students to retrace the route they take to school in their minds and recall any evidence of pollution along the way. For example, urban students as well as those who live along the shorelines of the Great Lakes may note smog, while rural students may note water runoff (that could contain nitrates) from fields treated with fertilizer and livestock feedlots and pastures.

Explain that many people are working to improve air quality, water quality, and reduce waste, and that students will learn about some groups in the community that take action on these important issues.

Use **OHT C-13 Second-Hand Smoke Ad** to facilitate discussion for the poster about second-hand smoke on page 261. Use the following prompts to analyze the poster:

- What is the message?
- Who is the audience? What clues does the format of the ad give about who is the audience (e.g., simple vocabulary, visuals of everyday life)?
- What formats does the ad use to attract attention?

Before reading the case study on page 261 together, explain how air pollution is not only an outdoors problem. The air indoors can also be polluted. The most harmful polluter of indoor air is tobacco smoke.

Have students share the paragraphs they wrote for question 2 on page 261.

Read about managing garbage on page 262 as a class. You might display a poster about recyclable garbage such as the one published by Toronto Recycles (see

Technology Links at the end of the section), and have students compare it with recyclable garbage where they live.

Read the Science and Literacy Link on page 262 together and make sure everyone understands what to do. Have students work in a group of three to develop an action plan for composting. Review what students learned about composting in Chapter 11. In advance, book the computer lab and gather text references. Refer students to the web sites suggested in the Technology Links on page 270 of this resource or other web sites you find. Allow time for students to do research before writing an action plan.

As you circulate, troubleshoot for students who experience difficulty organizing their search. You might provide specific web sites or key search words.

Consider using the following overhead transparency:

- **OHT C–13 Second-Hand Smoke Ad**

Accommodations

- Pair ESL and LD Learners with students who have stronger language skills.
- Have students who have difficulty writing a paragraph discuss the answer orally.
- Provide students who need more space to record their answer to question 1 on page 262 with a separate piece of paper. Remind them to put their name on it.
- Some students may require assistance with research and planning techniques. Pair students with complementary skills.
- Pair students who have difficulties using computers with those who are particularly knowledgeable.

Making Connections Answer (page 261)

2. Look for one example of pollution that puts species at risk such as landfills, smog, and pollutants that go down storm drains.

Check Your Understanding Answer (page 261)

2. Paragraphs will vary. Sample answer:

The students started a group and made an action plan to run an anti-smoking campaign.

They got the facts and used media to communicate the message. They sponsored a poster contest and organized a school assembly where they addressed the harmful effects of smoking by featuring a teen who had survived lung cancer. They also displayed smoke-free lungs and smoker's lungs.

Try This! Activity (page 263)

Purpose

- Students interview a spokesperson for a local environmental group.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
1 or 2 weeks before	<ul style="list-style-type: none"> • Book the computer lab (optional). – Gather information about local environmental groups.

Suggested Timing

30–45 min

Activity Planning Notes

In advance, decide if students will research local environmental groups or if you will provide information about local groups. You may need to book the computer lab in the former case. In the latter case, you might gather and display information about local groups.

Pique students' interest by highlighting some interesting campaigns that different environmental groups have undertaken in the local community. Consider having students form groups to interview a

spokesperson for the group in which they are interested, outside of class. Or, as a class, decide to invite a spokesperson to be interviewed during class.

Make sure students who set up the interview have the following information about the group: name of the group, address and phone number, and a contact person (if listed). Have students develop a list of questions using the information on page 263 as a guide. Make sure students get your approval before they interview someone.

In advance of an in-class interview, coach volunteers to introduce and thank the guest speaker.

Accommodations

- Pair ESL and LD Learners with students who have stronger language skills to develop questions.
- Have students who have difficulty writing discuss the interview orally.

Activity Wrap-up

- Have students present a summary of the interview, either orally or in written form. Alternatively, invite students to make a poster that highlights the group

they interviewed. The poster may include promotional material supplied by the group. Display the posters in the classroom.

Alternative Activity

- Instead of interviewing a spokesperson, students could research how to organize a campaign to reduce household hazardous waste. Provide them with the web site for Toxic Free described in the Technology Links. Have students summarize their findings using a format they choose.

Technology Links

- For information about environmental groups in Ontario, go to www.mcgrawhill.ca/books/Se10 and follow the links to Green Directory.
- For information about how to organize a campaign for reducing household hazardous waste, go to www.mcgrawhill.ca/books/Se10 and follow the links to Toxic Free.

Try This! Activity (page 263)

Purpose

- Students paint yellow fish next to storm drains in their community.

Science Background

In most cities, storm drains connect directly to the local body of water. Any salt, soap, litter, or fertilizer that runs off lawns, driveways, and roads ends up in local water bodies. These wastes harm fish and wildlife and reduce drinking water quality for people.

The Yellow Fish Road™ Program is a project of Trout Unlimited Canada. People involved in the Yellow Fish Road™ Program paint fish signs beside storm drains to

remind people that what they throw down the drain affects animal and plant populations in nearby water bodies. Participants also distribute fish-shaped hangers to local residents that explain the program.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
Several weeks before	<ul style="list-style-type: none">• Check with the municipality for permission to paint.• Contact the Yellow Fish Road™ Program to order painting kits.

WHEN TO BEGIN	WHAT TO DO
	<ul style="list-style-type: none"> • Book the computer lab (optional). • Arrange a painting day.
1 day before	<ul style="list-style-type: none"> • Familiarize yourself with the program. • Photocopy Assessment Master 2 Co-operative Group Work Rubric.
Day of	<ul style="list-style-type: none"> • Set out painting kits.

APPARATUS	MATERIALS
	<ul style="list-style-type: none"> • painting kits

Note: Painting kits include all safety and clean-up equipment.

Suggested Timing

10–15 min in class; time for painting depends on the scope of the project

Safety Precautions

- Remind students to wear safety vests and use pylons to set up a safety zone.
- Remind students to wear safety glasses and work gloves.

Activity Planning Notes

In advance, consult the municipality for permission to paint and recommended locations. Choose a location away from traffic and preferably close to the school. You might also ask adult volunteers to help monitor the activity.

Sign up for the program using the web site. You will receive a program guide that lists partners in Ontario. If one of the Yellow Fish Road™ partners is close to you, contact them directly to borrow complete painting kits. If you are not near any partners, contact Trout Unlimited directly.

Explain the Yellow Fish Road™ Program to students. Help students organize a painting date and location. Use the detailed program guide to carry out the project.

Accommodations

- Pair students with physical disabilities with those without disabilities, or have such students act as safety monitors or keep a tally of the painted storm drains.

Activity Wrap-up

- Have students share their experiences of the campaign and find out how many drains were painted.
- Pose the following discussion prompts:
 - Does action such as painting storm drains make a difference? Explain your thinking.
 - What are some other actions that an environmental group might undertake to raise awareness of pollution?
 - What can you do at school to make students and staff aware of pollution issues in our own backyard?

Technology Links

- For information about how to get involved in Yellow Fish Road, go to www.mcgrawhill.ca/books/Se10 and follow the links to Yellow Fish Road.

Find Out Activity (page 264)

Compare Packaging

Purpose

- Students find out how much waste there is from product packaging.

Science Background

Each Canadian produces about 1.7 kg of waste each day. That includes about 0.5 kg of packaging. In places where recycling programs are in place, the waste can be reduced by approximately 33%, depending upon the volume of newspaper, cardboard, glass bottles, and cans that households use. Most of the rest of the waste consists of organic waste and packaging. Packaging that is made from plastics is a serious problem since it is not easily broken down or biodegradable.

Advance Preparation

WHEN TO BEGIN	WHAT TO DO
2 or 3 days before	<ul style="list-style-type: none">• Have students bring a product in its original packaging to school.• Have on hand a few products with considerable amounts of packaging.
1 day before	<ul style="list-style-type: none">• Photocopy Assessment Master 17 Narrative Lab Report Checklist.
Day of	<ul style="list-style-type: none">• Set out materials.

APPARATUS	MATERIALS
<ul style="list-style-type: none">• scale or balance• products from home	

Suggested Timing

30–45 min

Safety Precautions

- Caution students to be careful with packaging that has sharp edges.
- Caution students not to eat any food products in the science lab.

Activity Planning Notes

One or two digital balances are adequate for the entire class.

Read the instructions as a class and make sure that everyone understands what to do. You might demonstrate the procedure and the calculations using **OHT C–14 Compare Packaging**.

As you circulate, troubleshoot for students who are experiencing difficulty.

Have students work in groups of five to share information for step 4. As a class, discuss the results. You might record the list of products and percent of packaging on the chalkboard. Ask what kinds of products have the most waste from packaging, and about better ways to package these products.

Distribute **Assessment Master 17 Narrative Lab Report Checklist** and review the criteria for the narrative lab report. Have students write and then discuss the lab report on page 265.

Accommodations

- Pair students with dexterity problems with those without such difficulties.
- Students with weak math skills could be paired with those who have stronger skills.
- Provide students who need the sentence prompts and/or more space to record their lab report with **Master 1 Narrative Lab Report**. Remind them to write their name on it.

Find Out Activity Answers (page 265)

5. a) Sample answer:

- I was looking for the percent of my product that was packaging.

b) Sample answer:

- First, I weighed the product with packaging. Second, I weighed the product alone. Third, I weighed the packaging alone. Fourth, I calculated the percent of the product that is packaging by plugging in the values in the formula. I divided the mass of packaging by the mass of product and packaging and multiplied by 100.

c) Answers will vary depending on products that students bring. Students should mention which types of products have the greatest amount of packaging.

d) Answers will vary. Sample answer:

- There is a lot of waste from packaging. Many products use packaging for advertising rather than only for protecting products. I am going to be more conscious of buying products that use minimal packaging not made of plastic.

6. Answers will vary. Look for two products and a strategy for reducing packaging for each. For example:

- a) make-up; choose product that has minimal packaging or that is made from recyclable materials
- b) shampoo; buy shampoo in large sizes

Activity Wrap-up

- Have students complete and then discuss question 6 on page 265.
- Challenge students to think of other strategies to reduce the amount of waste from packaging at home, at school, and at work (e.g., use re-useable dishes and cutlery; start a recycling program).
- Students might find out how to lobby manufacturers to reduce waste from packaging, and use recyclable or re-useable materials.

Ongoing Assessment

- Use the Making Connection question on page 261 to assess students' understanding of pollution and impact on species at risk.
- Assess the action plans that students completed for the Science and Literacy Link for comprehensiveness.
- Use **Assessment Master 2 Co-operative Group Work Rubric** to assess how well students worked together during the Try This! painting activity.
- Use the narrative lab report in Find Out: Compare Packaging to assess students' learning during the activity.

Technology Links

- For an interactive site about students active in the anti-smoking lobby, go to www.mcgrawhill.ca/books/Se10 and follow the links to Stupid Map.
- For information about recyclable waste in Toronto, go to www.mcgrawhill.ca/books/Se10 and follow the links to Toronto Recycles.
- For information about how to reduce packaging, go to www.mcgrawhill.ca/books/Se10 and follow the links to Action on Waste.

Alternative Activities

- Go on a neighbourhood walk and ask students to note evidence of pollution. Ask them to identify the types of pollution and share ideas about how to resolve the problem.
- Have students analyze ads using **BLM 12-2 Analyze Ads**. Students can refer to pages 250 and 256 for different kinds of evidence and formats.
- Have students complete **BLM 12-3 Case Study: Two Islands** as a review of the concepts in Chapter 12.

Chapter 12 Review (page 266)

SUGGESTED TIMING

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

BLACKLINE MASTERS

Master 5 Certificate
Master 6 List of Skills
BLM 12–3 Case Study: Two Islands
BLM 12–4 Chapter 12 Practice Test
BLM 12–5 Chapter 12 Test
BLM 12–6 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 12–4 Chapter 12 Practice Test** can be customized to produce extra reinforcement questions.

Summative Assessment

- Have students complete **BLM 12–5 Chapter 12 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.

If students have not already done so, have them complete **BLM 12–3 Case Study: Two Islands** to review concepts in Section 12.1. Once the review is completed and taken up, assign **BLM 12–4 Chapter 12 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	12.2	Endangered Species (page 255)
2	12.1	Human Impact (page 251)
3	12.3	Water Pollution (page 261)
4	12.3	Concerns and Solutions (page 260)
5	12.1	Human Impact (page 251)
6	12.1	Pesticides (page 253)
7	12.2	Endangered Species (page 255)
8	12.3	Concerns and Solutions (page 260)
9	12.1	Introduction of Species (page 251)
10	12.2	Endangered Species (page 255)
11	12.1	Pesticides (page 253)
12	12.1	Pesticides (page 253)
13	12.3	Concerns and Solutions (page 260)
14	12.3	Managing Our Garbage (page 262)

Chapter 12 Review Answers (pages 266–267)

1. a) extinct
2. d) native species
3. h) acid rain
4. b) pollution
5. c) exotic species
6. f) pesticides
7. g) endangered
8. e) global warming
9. Exotic species can spread if they have no predators or factors that control their population, and crowd out the native species.
10.
 - Endangered species are close to disappearing.
 - Threatened species are at risk of becoming endangered.
11. a) Answers will vary. Accept any reasonable impact of pesticides on frogs, such as:
 - Frogs may produce fewer tadpoles.
 - Frogs may be less resistant to disease.
- b) Answers will vary. Accept any reasonable action, such as:
 - Decrease the kind and amount of pesticides used for agricultural purposes.
12. Answers may vary. Look for the idea that wolves eat deer and deer eat wheat that grows in fields treated with herbicides. Traces of herbicides pass from wheat to deer and are stored in wolves' bodies too.
13. a) and b) Look for two of the following kinds of pollution and an effect for each one. Sample answers:
 - air pollution; burning fossil fuels results in global warming, which has serious effects that include melting of the polar icecaps
 - land pollution; garbage is buried in landfills, which results in loss of habitat for species
 - water pollution; acid rain can make the water in lakes too acidic for plants or fish to survive
14. a) Reduce the amount of waste you produce.
- b) Re-use things instead of throwing them out.
- c) Recycle glass, cans, paper, cardboard, plastic, and juice boxes.

Unit C Task: Reduce Waste at School

(pages 268–273)

SUGGESTED TIMING

2 class periods of 60–75 min each (includes introducing the task, brainstorming and choosing a project, planning and conducting a survey, and preparing a presentation)
30–40 min for Science and Media Link

MATERIALS

- chart paper and markers
- poster paper

BLACKLINE MASTERS

Master 2 Writing an Opinion Paragraph
BLM C–1 Research Waste Materials
BLM C–2 Develop a Survey
OHT C–15 Reduce Waste at School
Assessment Master 13 Oral Presentation Checklist
Assessment Master 14 Oral Presentation Rubric
Assessment Master 15 Visual Presentation Checklist
Assessment Master 16 Visual Presentation Rubric

Specific Expectations

BLT1.04 – use appropriate scientific terminology related to concepts of organisms living together

BLT2.06 – explain and interpret observations by summarizing patterns obtained from graphing data, organizing information, and communicating orally and in writing

BLT3.01 – develop a simple action plan, using a consistent written format, to address an environmental concern

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

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

Activity Planning Notes

In advance, arrange for a representative from an environmental group at school to come to class and talk about the work they do. Decide if students will do research only or also interview a school custodian about how waste is managed at school. You might consider having keen students videotape interviews and present them to the class.

As a class, read the task to give an overview. Have students develop questions before each interview. Use the voice balloons on page 268 as a starter for questions. Make sure that the questions are clear. The interview with the representative of the environmental group should provide students with ideas for planning their own project, increase awareness about environmental issues at school, and may encourage them to get involved in an action project.

The interview with the school custodian should help students research how waste materials are handled and provide ideas for planning their own project. Help students develop questions to find out how each material in the chart on page 269

is handled and disposed of. Have students use point-form notes.

Consider using **OHT C–15 Reduce Waste at School** to summarize students' findings.

Have students work individually to research one of the materials in the chart on page 269. Consider having them sign up for a material to ensure that all materials are represented for each group. Using chart paper, list the choices per group and leave space for students to sign up. After students sign up, have them use **BLM C–1 Research Waste Materials** to record answers to the questions. You might direct students to some of the web sites described in the Technology Links.

Consider modeling an example using an overhead of **BLM C–1 Research Waste Materials**. For example, for paper:

- a) Most of the paper goes in blue boxes. It is stored in recycle bins at school and a recycling company picks it up once a month. A lot of paper still gets thrown in the garbage.
- b) Recycling is good because it reduces the amount of paper that ends up in landfill sites.
- c) Post signs near the garbage containers and recycle bins to remind people to use the correct containers.
- d) Someone has to develop and make signs, and then post them.
- e) People might become more aware of the importance of recycling paper, and less paper might end up in the landfill.

Provide time for students to complete the activity before they share their worksheet with their group. In this way, the group will have access to the information about how each of the waste materials is handled at school.

Have the small groups use the information they collected to help decide on a project to reduce waste at school. Provide time for groups to brainstorm and choose a project. Use the voice balloons to stimulate discussion.

Explain how a survey is useful to generate awareness of an issue and might encourage other students to get involved with the project. As a class, read and discuss the facts about waste on page 270. Have students work individually to highlight five facts that they found interesting before comparing their choices with one or two other students and answering the questions on page 271. You might have students circle the two facts that most changed the way they think about garbage and explain why. Encourage students to use these two facts as a starting point to develop survey questions.

Re-read the information about the survey on page 271 and encourage discussion to make sure students understand what to do. Have them use **BLM C–2 Develop a Survey** to record the questions. Read the information on the blackline master and tell students to use all of the information that they gathered as a group, the chart on page 269, and the facts on page 270 to help them develop questions. As

Technology Links

- For student-friendly sites about waste management, go to www.mcgrawhill.ca/books/Se10 and follow the links to Waste.
- For information about recyclable waste, go to www.mcgrawhill.ca/books/Se10 and follow the links to Recycle.

Accommodations

- Use the voice balloons to provide ideas for students who need help to think of a project or ideas for a poster.
- Some students will need additional reinforcement to process the information and the instructions. Alternatively, such students could be paired with students who have stronger skills.
- Pair ESL and LD Learners with those who have stronger language skills to develop and carry out the survey.
- If you have access to a computer lab, allow students to use clip art and graphics software packages to create their poster. The zoom feature on most photocopiers can be used to enlarge images to poster size.

Summative Assessment

- Use **Assessment Master 14 Oral Presentation Rubric** and **Assessment Master 16 Visual Presentation Rubric** to assist you in assessing student work on the task.

you circulate, coach students who need help developing questions.

Consider having students develop a survey and then create a class survey that all students use. If so, you might compare the results as a whole class.

Depending on the time provided for students to work on the task during class, they might conduct the survey and summarize the results on their own time. Alternatively, arrange for students to interview students in a neighbouring classroom or the cafeteria. Provide time for students to share and discuss their observations before summarizing the results. Have students answer the follow-up questions on page 271.

Have students read the instructions on page 272 about developing a presentation that promotes the project they chose. Each student's presentation should include facts about reducing waste, a slogan, and a poster. Encourage students to prepare cue cards to help make their presentation.

Use **Assessment Master 15 Visual Presentation Checklist** to help students review the criteria for the poster and slogan. Use **Assessment Master 13 Oral Presentation Checklist** to review the criteria for the oral presentation.

Have students complete and then discuss question 1 on page 272.

Consider using the following blackline masters and overhead transparency:

- **BLM C-1 Research Waste Materials**
- **BLM C-2 Develop a Survey**
- **OHT C-15 Reduce Waste at School**
- **Assessment Master 13 Oral Presentation Checklist**
- **Assessment Master 15 Visual Presentation Checklist**

Making Connections Answer (page 272)

1. a) and b) Look for point-form notes that describe four or five ideas for addressing one of the problems. Sample answer:

People don't know much about recycling and need more information.

- get involved with a group that raises people's awareness of recycling
- make presentations to community groups
- go door to door and ask people to make pledges to take action
- talk to people in the workplace about starting a recycling program

Science Background

Incinerators are also called waste to energy plants. They are common in Europe where they eliminate most of the waste that remains after recycling and composting. The idea is to recycle as much as possible before incineration since organic materials are difficult to burn.

Peel Region burns about 175 000 tonnes every year, which represents about two thirds of what remains after recycling and composting in Brampton and Mississauga.

It is important to separate waste before burning it. For example, since batteries contain a lot of cadmium and lead, they should be removed from waste that will be burned.

Science and Media Link (page 273)

You may wish to do this activity before students start working on the task. Alternatively, it could be done afterward.

You might introduce the activity by discussing with students how their municipality disposes of waste (i.e., burn or bury). You might ask students to use what they have already learned about pollution to identify some advantages and disadvantages of either method.

As a class, read the article. Ask students to identify the scientific information in the article and explain who they think is the audience for the article. Ask how the visual helps convey the topic.

Consider having students highlight the advantages and underline the disadvantages of burning waste. Then as a class, discuss and summarize the advantages and disadvantages of burning and burying waste. Record their ideas on chart paper before assigning questions 1 and 2.

Have students complete question 3 using **Master 2 Writing an Opinion Paragraph**. As a class, you might ask students to share their responses in a class discussion.

Accommodations

- Pair ESL and LD Learners who need assistance with writing an opinion paragraph with those who can help. Alternatively, consider allowing students to present their opinion orally.

Ongoing Assessment

- Use student paragraphs to assess their understanding of the issues about burning and burying waste.

Technology Links

- For information about managing waste initiatives in Ontario cities, go to www.mcgrawhill.ca/books/Se10 and follow the links to Garbage-free Future.
- For student-friendly information about burning waste, go to www.mcgrawhill.ca/books/Se10 and follow the links to Burn It.

Should We Burn It or Bury It? Answers (page 273)

1. d) a) and b)
2. d) All of the above.
3. Answers will vary. Expect students to complete the sentence stems that are provided in **Master 2 Writing an Opinion Paragraph**.