
CHAPTER 10

WASTE MANAGEMENT

The lesson in this chapter centers on the theme of **waste** management. The lesson begins with a warm-up activity in which students are introduced to key vocabulary related to the theme. Then students work in small groups and complete a short quiz to assess their background knowledge about the topic of waste management. After completing and discussing the quiz, students read and discuss a list of waste reduction habits. The lesson concludes with a short writing activity in which students list the waste reduction measures they will adopt and/or try to persuade their families to adopt.



BACKGROUND INFORMATION

People today often discard items that years ago would have been repaired or saved for other uses. In fact, many modern products (e.g., **disposable** razors and **non-refillable** pens) are designed for a relatively short life that ends in a wastebasket.

How to manage waste in an environmentally sound manner is a complex and sometimes controversial issue. There is no single, simple solution to the solid waste problem. The use of a variety of waste management practices is recommended to reduce waste management problems most effectively and safely. There are three levels to the **hierarchy** of waste management: first, source reduction; second, **recycling**; and third, **combustion** and **landfill**.

Source reduction means reducing the amount and the **toxicity** of the waste that is produced. Individuals and families can participate in source reduction by buying more products that are **durable** and **non-disposable**, and more products that have fewer **toxic components** and less packaging. Reusing items that we usually throw out is a good way to reduce the waste disposal problem. Manufacturers have a big role to play in source reduction. They should be encouraged to produce products that have less packaging and fewer toxic components.

Recycling is the second level of waste management. Reuse of materials not only saves energy and **natural resources**, but it prevents potentially useful materials from being buried in landfills or burned in **combustors**.

Waste combustion and landfills are the third level of waste management. Combustion has two great benefits: it reduces the bulk of waste, and it also produces energy. Source reduction and recycling help to make **combustion** and landfills safer and more efficient by reducing both the quantity and the toxicity of waste, and by removing **recyclable** materials that might be difficult to burn or that could cause harmful **emissions**. Landfills are needed to handle waste that cannot be recycled or safely burned. Also, ash from waste combustion must be sent to specially designed landfills.

Waste reduction, recovery, treatment, and recycling processes are becoming more efficient, but no matter how efficient they become, there will be some amount of waste needing landfills. People can, however, greatly reduce this amount by becoming aware of how they contribute to the solid waste problem and by changing their habits to promote more efficient use and reuse of resources.



CLASSROOM APPLICATIONS

Preliminary Lesson Planning

Materials Preparation:

- Duplicate enough copies of the quiz How Much Do You Know About Waste? in [Appendix A](#) to give one copy to each group of 3-4 students.
- Duplicate enough copies of the list Waste Reduction Habits in [Appendix B](#) to give one to each student.

Vocabulary Considerations:

Before using the quiz How Much Do You Know About Waste? and the list Waste Reduction Habits, consider what vocabulary students will need to know in order to carry out the lesson successfully. Determine which vocabulary items are already familiar to students, and which will be new to them. Some important terms and their definitions are included in the [Glossary](#).



WARM-UP ACTIVITY (APPROXIMATELY 10 MINUTES)

Purpose:

- To stimulate students' interest in the topic of waste management
- To activate students' background knowledge
- To introduce students to key vocabulary related to the topic of the lesson

Procedures:

1. Write the word waste on the board and ask the class what they think the word means. As student volunteers give their answers, write key words from their responses on the board. (One possible definition of waste is "things that are thrown out when they are used up or no longer needed".)
2. Ask the class if they know any synonyms for the noun waste. As student volunteers give their answers, write the synonyms on the board. (Possible answers include **garbage**, **trash**, **rubbish**, **litter**, **refuse**, **scrap**, and **junk**.)
3. Ask students to name some examples of things that they throw away at school or at home. Write the students' examples on the board.
4. Discuss with the class where all this waste or garbage might go:
5. What happens to waste when it leaves your home or school?
6. Where does it go?
7. Write the words **dump**, landfill, and combustor on the board. Explain that a dump is a place where garbage is taken and left, a landfill is a place where garbage is buried, and combustor is a place where garbage is burned.



ACTIVITY #1 (APPROXIMATELY 15 MINUTES)

Purpose:

- To allow students to share their background knowledge about waste management
- To give students an opportunity to assess their background knowledge about waste management
- To expand students' knowledge about waste management
- To have students practice reading, listening, and speaking in a meaningful way
- To stimulate discussion

Procedures:

1. Divide the class into groups of 3-4 students and give each group a copy of the quiz How Much Do You Know About Waste? in [Appendix A](#).
2. Explain the task to the students. They are to work together in their groups, reading and discussing the items on the quiz, and deciding what they think is the correct answer to each question. Tell the students they will not be graded on the quiz. The purpose of the quiz is to allow them to discover how much they already know about the waste.
3. Make sure students understand the questions on the quiz.
4. Groups of students work together, reading and discussing the questions on the quiz, and choosing their answers.
5. After groups have finished discussing the questions on the quiz and choosing their answers, student volunteers take turns reporting their group's answers to the class. As volunteers report, write the answers on the board. If students disagree, ask them to report their answers to the questions at hand, and write their answers on the board as well. Do not indicate at this stage whether the students' answers are right or wrong.
6. After students have reported their answers to all ten questions, read off the correct answers to the class. (The answers are provided in the Answer Key in [Appendix C](#).)
7. Ask the class the following questions, and allow student volunteers to give their answers:
8. Did any of the answers to the questions on the quiz surprise you? If so, which ones?
9. What, if anything, did you learn from this quiz?



ACTIVITY #2 (APPROXIMATELY 15 MINUTES)

Purpose:

- To give students an opportunity to evaluate their own daily habits related to waste reduction
- To increase students' awareness of everyday habits that reduce the amount of solid waste produced
- To have students practice reading, listening, and speaking in a meaningful way
- To stimulate discussion

Procedures:

1. Distribute the list Waste Reduction Habits in [Appendix B](#). Give one copy to each student.
2. Tell students to silently read the items on the list. Answer any questions the students may have about the vocabulary used in any of the items.
3. Ask students to work together in groups of 3-4. Groups should discuss each habit on the list, using the following questions as a basis of discussion of each habit:
4. How does the habit help to reduce waste?
5. Do you regularly employ this habit? Why or why not?
6. When students have finished the group discussion, go over the items on the list one by one, and ask for student volunteers to explain how the particular habit helps to reduce waste.



COOL DOWN ACTIVITY (APPROXIMATELY 10 MINUTES)

Purpose:

- To give students an opportunity to decide which waste reduction habits are adaptable to their own lives and the lives of their family
- To practice writing
- To conclude the lesson

Procedures:

1. Ask students to write a paragraph or two summarizing what they have learned in today's lesson, explaining whether or not they believe waste reduction is a serious issue for themselves and their families, and listing some habits they will adopt themselves and/or try to persuade their families to adopt.
2. Allow students 5 minutes or so to write their paragraphs.
3. After students have finished writing, ask for volunteers to read their paragraphs aloud to the class.



EXTENSIONS

1. Ask students to work in groups to compile their own original lists of waste reduction habits.
2. Students can be asked to create posters to promote the idea of waste reduction.
3. Have students carry out a litter cleanup at a local park or recreational area.
4. Have students survey eight to ten people to find out their answers to the question: "Do you and your family do anything to reduce waste production? If so, what do you do?" Ask students to write a one-page summary of the responses they receive, and to be prepared to tell the class what they learned from the people they interviewed.

Refer to the [Internet Resources](#) section for more information and lesson planning ideas.



How Much Do You Know About Waste?

1. Washing and reusing plastic bags is unhealthy. True or false?
2. The use of personal computers has reduced paper consumption. True or false?
3. What is the best shopping bag to use at a supermarket?
 - a. A plastic bag.
 - b. A paper bag.
 - c. Your own reusable bag from home.
4. How can you reuse paper that has been printed on one side?
 - a. Use it in your printer or fax machine (print on the blank side)
 - b. Use the blank side for scratch paper.
 - c. Both a and b.
5. Large mailing envelopes that have been used before can be reused for mailing. True or false?
6. Latex paint cannot be recycled into new paint. True or false?
7. Used tires can be used to make roads. True or false?
8. What are tin cans made of?
 - a. Tin.
 - b. Steel.
 - c. Aluminum.
 - d. All of the above.
9. Most Paper is made from trees. What other materials can be used to make paper?
 - a. Hemp.
 - b. Rice.
 - c. Cloth rags.
 - d. All of the above.
10. Plastic can be recycled. True or false?
11. What can people who work in offices do to use less paper?
 - a. Use e-mail.
 - b. Make two-sided copies.
 - c. Share reports and printed information.
 - d. All of the above.
12. Why is it important to reuse clothing, furniture, toys, electronic equipment, and other materials?
 - a. It saves money.
 - b. It helps save natural resources.
 - c. It helps save energy.
 - d. All of the above.

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Waste Reduction Habits

1. Buy paper products made from recycled paper.
2. Buy paper products made from unbleached paper.
3. When using dangerous cleaning products, buy and use only the amount you need for the task.
4. Buy refillable pens, lighters, flashlights, and cameras.
5. Reuse plastic containers and glass jars to store pencils, crayons and other items.
6. Share magazines with friends.
7. Reuse envelopes and file folders.
8. Use both sides of writing paper.
9. Keep plastic bags and reuse them at home or at stores.
10. Repair, rather than replace, broken items.

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APPENDIX C

Answer Key: How Much Do You Know About Waste?

1. False. (When plastic bags have been washed and dried thoroughly, they can be reused safely again and again.)
2. False. (The use of personal computers has actually increased the amount of paper that people consume.)
3. c. Your own reusable bag from home. (People can save the trees used to make paper bags and the energy use to make plastic ones, by taking their own shopping bags to the store.)
4. c. Both a and b. (Reusing paper reduces the need to buy more paper.)
5. True. (You can reuse a mailing envelope by sealing it with tape, glue, or some other means.)
6. False. (Many cities recycle latex paint and use it to paint public buildings or cover up graffiti.)
7. a. True. (Used tires are often shredded and mixed with asphalt to make roads that last longer and need less repair.)
8. b. Steel. (People called steel cans "tin cans" for a long time, but they are actually made of steel.)
9. d. All of the above. (Before the twentieth century, most paper was made from cloth rags.)
10. True. (Many types of plastic are recycled into furniture, carpets, clothing, and other items.)
11. d. All of the above.
12. d. All of the above.

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