LESSON 4: Packaging Can Become Litter

LESSON'S CONCEPTS

- Most litter is materials used in packaging.
- People can choose to reduce the amount of packaging they buy and use.

PURPOSE

Students will learn that similar products (e.g., cookies) are packaged in a variety of ways and that some packaging might be considered excessive. They learn how to reduce the amount of disposable packaging in their lunches.

OVERVIEW

In this lesson students will:

- Discuss the purpose of packaging.
- Compare the amount of packaging used for different cookies.
- Identify the waste created by packaging.
- Determine that some packaging is easier to recycle than others.
- Reduce the amount of disposable packaging used in preparing their lunches.

CORRELATIONS TO CALIFORNIA'S CONTENT STANDARDS AND FRAMEWORKS

- Students compare packaging material and the packaging of different brands of cookies. They classify packaging of cookies according to its purpose and what material the package is made of.
  - "Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept, students know objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, attraction to magnets, floating and sinking, etc.)." (*Science Content Standards, Grades K–12*; Kindergarten; Physical Sciences, Standard 1a)
  - "All matter has properties that can be observed, defined, and recorded. Matter occupies space, it has substance, and we can measure its weight." (*Science Framework*, page 41.)
  - "Students sort and classify objects." (*Mathematics Content Standards for California Public Schools, Kindergarten Through Grade Twelve,* page 2)
  - "Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept . . . students will . . . record observations and data with pictures, numbers, and/or written statements." (*Science Content Standards, Grades K–12*; Grade 1; Investigation and Experimentation, Standard 4b)

SCIENTIFIC THINKING PROCESSES

observing, communicating, comparing, classifying, applying

TIME

45–60 minutes to prepare for the lesson; 60 minutes for "Part I" and 60 minutes for "Part II" to implement the lesson

VOCABULARY

packaging

PREPARATION

___ **1.** Read the "Background Information for the Teacher" at the end of this lesson.

___ **2.** Ask students to bring to class the next day a variety of packaging materials, such as aluminum cans, polystyrene trays, and plastic produce bags. You might want to bring extra packaging items.

___ **3.** Make four copies and one transparency of "Packaging of Cookies Chart" or make one large class chart for younger students (page 195).

MATERIALS

For this activity, chocolate chip cookies were selected, but any other type of cookie can be used. The purpose is to compare similar types or brands of cookies which are packaged differently.

___ Five packages of cookies: (1) packaged bulk cookies (e.g., ones baked by the store); (2) bulk prepackaged cookies; (3) cookies in a tray; (4) cookies divided into small groups by paper cups; and (5) other cookies packaged differently from those described in 1–4 (e.g., individually packaged)
___ Samples of packaging that students are familiar with (e.g., "prepackaged lunches")
___ Four copies and one transparency of "Packaging of Cookies Chart" or one large class chart (for younger students)
___ Butcher paper for developing a chart to compare pros and cons of packaging
___ Clean cloth towels or reusable plates on which to lay the cookies
___ Plastic gloves or sandwich bags

(***Note:*** If students wear plastic gloves or sandwich bags while handling the cookies, they can eat the cookies later. Students could think of ways to reuse the gloves or bags when they are finished.)

Note: It is recommended that the class use as few gloves or sandwich bags as necessary, because the ultimate goal is to avoid producing unnecessary waste.

Optional

___ A video camera to use for the "Application" section "B"

PRE-ACTIVITY QUESTIONS

A. Ask students whether most of the litter they picked up on the school grounds (or other areas) in Lesson 1 was packaging material. *Yes.* Why do they think that is so?

B. Have students show the packaging they brought from home. Give students an opportunity to share with the class the packaging they brought.

C. Have students separate the packaging into categories. Allow them to select whatever categories they choose, but note how they decide to do this. For example, did they classify the packaging by type of material (plastic, paper), by whether it can be reused or recycled, or by some other method?

D. Ask students why things need to be packaged. You might show students something they are familiar with, such as a "prepackaged lunch." Have students take it apart to look at the packaging.

E. Have students discuss the purposes for the packaging; e.g., maintaining safety, marketing, protecting the product. List their ideas on the chalkboard.

F. Have students help you list some disadvantages of overpackaging. *Could become litter; fills up garbage cans*.

Note: The thought of what is "overpackaging" can vary from person to person.

PROCEDURE

Part I, Analyzing Cookie Packaging

A. Ask students:

- Do you ever eat cookies as a snack at home?
- What type of packaging do the cookies usually come in?

B. Show students the five packages of cookies. Have students make guesses as to which cookies they think will produce the least amount of packaging waste and which ones will produce the most. Write their guesses on the chalkboard or butcher paper and compare this to their findings at the end of this activity.

Note: With younger students, consider doing the following activity as a class, analyzing one package of cookies each day.

C. Divide the class into four teams.

1. Provide a copy of "Packaging of Cookies" to each group.

- Analyze one package of cookies as a class and complete the first row on the "Packaging of Cookies Chart."
- Assign each team a number from two through five (to correspond to the numbers on the "Packaging of Cookies Chart").
- Give each team a different package of cookies to analyze.
- Provide plastic gloves or sandwich bags with which students should handle the cookies.

2. Ask students to complete columns "A" through "D" on the chart for the number they were assigned.

- They should estimate the number of pieces of packaging and the number of cookies in the package.
- Then they should look at the outer packaging and open the package to see whether there is additional packaging inside.
- They should count the pieces of packaging and then count the cookies and record their findings on their charts.

Note: When counting the number of cookies, students may have to spread the cookies out on a towel.

3. Have the students identify the different types of packaging (paper bag, plastic coated bag, plastic tray, paper cups). Help them to complete column "E" in "Packaging of Cookies Chart."

Note: The "Packaging of Cookies Chart" can also be used as an assessment tool.

4. Ask groups to make their presentations to the class regarding their findings. Record on the transparency, "Packaging of Cookies Chart," each group's responses.

5. Discuss with students why they think the manufacturer chose each type of packaging. *To keep the product safe, to advertise, to keep contents from breaking*.

6. Ask students:

- What were the differences between your estimates and the actual number of packaging and cookies?
- Were you surprised at the actual number of pieces of packaging and cookies? Why or why not?
- Do you think that all the packaging is necessary? Why?

7. Ask students to determine whether there is unnecessary packaging in the package of cookies that they were assigned and to circle "yes" or "no" in column "F" in the "Packaging of Cookies Chart." Ask groups to show the class which pieces of packaging are not necessary and to explain why.

8. Ask students whether any of the packaging can be reused or recycled. Have students record their answers in column "G" of the chart. Does any of the packaging contain recycled material? (This information would be printed on the outside package.)

9. Discuss the pros and cons of packaging for cookies.

Note: Save the packaging from the cookies to use in the "Extension" section of this lesson.

D. Go to "Discussion/Questions for Part I" on page 192.

Part II, Zero-Waste or Trash-Free Lunch

Note: If you do not want to organize a zero-waste lunch, consider doing section "A"; otherwise, do sections "B" through "F." You can also do section "A" as an introduction to the zero-waste lunch (then skip section "B").

A. Provide a variety of snacks to students (or ask them to bring snacks).

- Bring or have students bring their snacks to a central area and lay them down in front of them.
- Ask which snack will probably end up with the most amount of trash.
- Discuss each answer, including what is recyclable (e.g., aluminum can) and what is reusable (e.g., plastic container).
- Ask which snack made the least amount of trash.

(Use school's letterhead.)

Dear Parent or Guardian,

Please read the following with your child:

We have been learning about ways to reduce, reuse, and recycle. We are planning a "Zero-Waste Lunch" on _____ to show that people can generate less trash by using reusable or recyclable containers and other items, such as reusable eating utensils.

Please talk to your child about ideas for this lunch so that there will be as little garbage left as possible. Many ideas were discussed in class. Some ideas are listed below:

- Place the lunch items in a lunch box, knapsack, or cloth bag (e.g., a small pillow case).
- Use reusable containers (e.g., plastic containers, such as yogurt or margarine containers) for sandwiches and other lunch items.
- Have the drink be in a thermos, reusable plastic water bottle, or a recyclable aluminum can.
- Bring metal or reusable plastic utensils.
- Bring a cloth napkin instead of a paper napkin.

Thank you for your cooperation,

B. Ask students to bring their lunches to eat in the classroom (or ask them to bring all the waste from their lunches to class).

- After lunch, sort and analyze the trash.
- Determine with students what to do with the trash. (Some can be reused, some can be recycled, and some needs to be put into the trash can.)

C. Ask students how they can reduce the amount of trash they generated from their lunches. Suggest to students to bring a zero-waste or trash-free lunch (or snack).

- Discuss with students how a zero-waste or trash-free lunch could be packaged.
- Write and/or draw ideas on the chalkboard. For example, sandwiches can be brought in a reusable plastic container. The lunch can be packed in a cloth bag or lunch box.
- Select a day to have a trash-free lunch (or snack).
- Ask the cafeteria for help for those students who do not bring lunches from home.
- Explain to students that even if everyone is not able to bring a zero-waste lunch, the waste from the entire class will still be lowered.

D. Send a letter to parents explaining the purpose of the zero-waste lunch and ask them for their cooperation.

E. On the day of the zero-waste lunch and before the students eat their lunches, ask them to share with the class their ways of packaging.

F. At the end of the lunch period, evaluate the amount of trash that was generated.

- How did this amount of trash compare to the first trash from the lunch that we analyzed?
- Can less trash be generated next time? If so, how?

DISCUSSION/QUESTIONS

For Part I, Analyzing Cookie Packaging

A. What did you learn about packaging today?

B. What really surprised you about the different ways that cookies are packaged?

C. Which cookie packaging produced the most solid waste? How do your results compare with your predictions at the beginning of the lesson ("Procedure, Part I," section "B")?

D. What can you do to conserve natural

resources and lower your production of waste in regard to cookie buying and packaging? *Buy cookies with the least amount of packaging; buy cookies in reusable or recyclable packaging.*

For Part II, Zero-Waste or Trash-Free Lunch

A. What are some ways that we can pack a lunch to reduce waste*? Use a lunch box; place foods and drinks in reusable or recyclable containers.*

B. How can packaging create litter? *Someone removes the packaging, then drops it; packaging material is blown by the wind from a trash can on the ground.*

APPLICATION

A. Have students come up with ideas on how to reuse the plastic gloves and bags they used in this lesson.

B. Ask students to write a sentence or two in their journals about what they have learned in this lesson. They can also draw a picture. Have them share their journal entries in small groups. Check each student's writing.

C. Place a trash can outside the classroom. Before recess, give each student a piece of wrapped candy. As students walk out the door, observe (or use a video camera to videotape) what they do with the wrappers. When they come back from recess, have students tell you what they did with their wrappers. Share with students your observations. Ask students what they could do with wrappers if there is no garbage can close by. *Place the wrapper in a pocket.*

D. Have students identify the types of natural resources used to make the packaging. Where does plastic come from? Where does paper come from? Have students identify examples of natural packaging, such as banana peels and orange peels.

Note: The K–3 Module, Unit 1, provides information and lessons about natural resources.

E. After a couple of weeks, discuss with students the types of materials they use to bring their lunch in. Ask students to identify ways they can reduce the packaging in their lunches. Have students write a letter to their parents explaining what they have learned.

Project Idea: Have students organize the sale of reusable lunch bags or boxes. They can have adults help them to sew cloth lunch bags.

Picture intentionally deleted.

Picture intentionally deleted.

At the Solar Community Housing Association, Homestead CO-OP, children observe packaging from cookies.

EXTENSIONS

A. Encourage students to use their imaginations to create art projects using packaging materials. They can also develop a list of uses for various types of packaging. You may want to have a contest between the teams, and the team that has the most ideas for different ways to use the packaging wins. You can also create other "winning categories" like "most creative idea," "funniest idea," and "easiest to create."

B. Have students weigh the package with cookies, then just the package. How much of the weight is packaging material?

C. Invite a school cafeteria employee to speak to the class about food packaging. Why is it important? What happens to the packaging after the food is eaten?

D. Have students design a package for cookies that will protect the cookies, but will not have "excessive" packaging. Students could send their ideas to the manufacturer, or students could tell other students why they should buy certain packages of cookies.

Transparency and Student's Page

PACKAGING OF COOKIES CHART

1. Brand of cookie	A Estimated pieces of packaging	B Estimated number of cookies in package	C Actual pieces of packaging	D Actual number of cookies in package	E What type of packaging was used? (Circle answer.)	F Is there unnecessary packaging? (Circle answer.)	G Can the packaging be reused or recycled? (Circle answer.)
2.					• Plastic coated bag • Paper bag • Paper tray • Paper cups	Yes No	• No • Can be reused • Can be recycled
3.					• Plastic coated bag • Paper bag • Paper tray • Paper cups	Yes No	• No • Can be reused • Can be recycled
4.					• Plastic coated bag • Paper bag • Paper tray • Paper cups	Yes No	• No • Can be reused • Can be recycled
5.					• Plastic coated bag • Paper bag • Paper tray • Paper cups	Yes No	• No • Can be reused • Can be recycled
					• Plastic coated bag • Paper bag • Paper tray • Paper cups	Yes No	• No • Can be reused • Can be recycled

BACKGROUND INFORMATION FOR THE TEACHER

At an early age children can understand that when they buy something, they also buy the packaging. They can assume some responsibility, as wise consumers, to avoid purchasing overpackaged items, to make sure that packaging does not become litter, and that packaging is reused or recycled. If it is waste, they need to know how and where to dispose of it properly.

Packaging has many uses and benefits. Packaging protects the contents from physical damage and spoilage, and it may also be used to ensure that the contents are sanitary. By reducing spoilage and damage, packaging can actually reduce the volume of solid waste. Labels on packaging identify contents and provide directions for use. Packaging may help retailers advertise their goods, keep sales records straight, and discourage theft. Packaging also provides consumer convenience. It may reduce waste by dividing food and beverages into individualized portions, which minimizes leftovers that could end up in a landfill.

Unfortunately, packaging contributes substantially to the volume of solid waste that is commonly disposed of, depletes natural resources, adds to litter and pollution, and increases the cost of a product. Most packaging is meant to be disposed of after one use. Some packaging materials end up as nonbiodegradable or toxic materials in the environment. Most litter is packaging and includes cans, bottles, paper wrappers, and plastic and paper bags.

Excessive packaging is often in the eye of the beholder. Generally, packaging that is purely for the convenience of the retailer or consumer, only for advertisement, or that is not related to protecting contents from damage or spoilage may be considered excessive.

Excessive packaging can be reduced by encouraging packaging manufacturers and large-scale packagers to implement voluntary packaging reduction and research into new, less harmful or wasteful packaging. Packaging regulations by federal and state governments could reduce excessive or environmentally harmful packaging and promote the use of reusable and recyclable packaging. Such regulations can take the form of container deposits, taxes, labeling, regulatory reviews, bans on specific packages, financial incentives (tax breaks or penalties), and packaging standardizations.