



DATA ANALYSIS

Project 1

# The benefits of recycling

**Most communities across the country** have recycling programs: newspapers, glass, aluminum cans, and plastic bottles are collected and transported to recycling centers, where they can be processed and used again in some form or another. While most people recognize the importance of recycling, few realize how significant the benefits of recycling truly are.

## Goal

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Working in groups of four or five, students will research recycling to determine who or what benefits from recycling programs. Each group will write a summary of its conclusions and present its findings to the class. *Suggested time:* Four to five class periods over two weeks.

## Math Skills to Highlight

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1. Using data as a basis for making decisions about recycling
2. Analyzing and simplifying numbers to choose an appropriate scale for a graph

3. Reading and creating graphs, tables, and charts
4. Using math and writing as a means to communicate ideas
5. Using technology in problem solving

## Special Materials/Equipment

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Reference books and articles about recycling; markers; felt-tipped pens; poster paper; rulers; compasses; protractors; scissors; paste; tape. *Optional:* Computers and printers to produce spreadsheets, graphs, and tables; Internet access for research; overhead projectors and transparencies for presentations.

## Development

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Before beginning this project, talk about recycling with your students. Most communities have recycling programs, so your students will be familiar with them. Most people assume that recycling is beneficial. But who actually benefits and in what ways? At the very least, recycling programs reduce stress on the environment by cutting the demand for natural resources. In addition, they create jobs (recycling companies have become thriving businesses), save money, and spur the development of new technologies.

- For this project, focus your groups on the main areas of recycling: newspapers, glass, aluminum cans, and plastic bottles. Although some communities also recycle grass clippings, electronics, and used motor oil, information on the first four will be easier to find.
- Distribute copies of Student Guide 1.1, and review the information with your students. Be sure they understand what they are to do. Point out that students should concentrate their research efforts not only on the benefits that recycling offers people but also its benefits for the environment.
- Mention that this project is quite broad and that groups may come to different conclusions. The groups should support their findings with facts.
- Hand out copies of Data Sheet 1.2, "Some Facts About Recycling." This sheet provides students with interesting information about recycling that may help them to get started with their research.
- Since students will need to conduct research, plan to spend at least two class periods in the library. A week or so ahead of time, inform your school's librarian about your project and ask her to reserve books on recycling.
- Encourage students to spend some of their own time researching.
- Encourage students to conduct research on the Internet.

- Remind students to keep an accurate list of their sources. This will make it easier to verify facts.
- Reserve at least one class period for students to meet in groups to analyze and organize their data. They should work toward a consensus regarding the benefits of recycling. To support their findings, suggest that they create posters, charts, graphs, tables, or transparencies for the overhead projector. You may set aside additional class time for them to work on their presentations.
- Suggest that students use computers to create spreadsheets, graphs, or tables to illustrate their results. Set aside at least one class period for the presentations. If you have an overhead projector in class, encourage students to incorporate its use in their presentations.

## **Wrap-Up**

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Students present their findings to the class.

## **Extensions**

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Visit a recycling center for a class trip. Invite a recycling expert to discuss recycling with the class or explore other areas of waste management such as nuclear waste.

## STUDENT GUIDE 1.1

# The Benefits of Recycling



## ***Situation/Problem***

Most communities across the country maintain recycling programs in which newspapers, aluminum cans, glass bottles, and plastic bottles are recycled. Most people assume that recycling is beneficial. But who actually benefits? For example, does recycling reduce stress on the environment? Does it improve the quality of life for people? Does it create new jobs, save money, or promote the development of new technology?

For this project, your group will attempt to answer the question, What are the benefits of recycling? You will write a summary of your conclusions and then present your findings to the class. Include graphs or illustrations that support your conclusions.

## ***Possible Strategies***

1. Divide the tasks of this project among group members. Tasks will include researching; analyzing and organizing information; creating materials such as graphs, posters, and other displays to support your conclusions; and presenting your conclusions to the class.
2. After gathering research, analyze your information and draw conclusions.

## ***Special Considerations***

- When organizing tasks, divide them equally. For example, one member may research newspaper recycling, another may research aluminum cans, and still others may research glass and plastic bottles. Some members may be responsible for creating posters to support your conclusions, while others may do the actual presentation.

# The Benefits of Recycling *(Cont'd.)*

- During research, look for the benefits recycling offers to people, companies, and the environment. Support your findings with facts.
- Keep an accurate list of your sources by using a standard bibliographical format. Note specific page numbers where information was found. Your English text or a writer's stylebook has information on bibliographies. Also include any online or electronic sources you used in researching.
- After you have gathered all your information, analyze it, and draw conclusions about the benefits of recycling. Explain your conclusions in a summary. Your summary should contain three parts: (1) an opening in which you provide your results, (2) a body that offers details supporting your results, and (3) a closing in which you reemphasize the main point of your summary.
- Illustrate your results with graphs, charts, tables, or posters. Consider using computers to create graphs and tables from spreadsheets.
- Decide how you will present your findings to the class. Will one group member act as spokesperson, or will each member have a part in the presentation? Rehearse your presentation so that you are able to conduct it smoothly. Be ready to answer questions from the class.

## ***To Be Submitted***

1. Project summary
2. Notes and sources
3. Supplementary materials such as graphs, tables, or charts

Name \_\_\_\_\_

## DATA SHEET 1.2

# Some Facts About Recycling

- Approximately 40% of the solid waste in the United States is paper and paper products.
- About 45% of the paper Americans use each year is recovered for recycling.
- Making 1 ton of recycled paper uses only 60% of the energy needed to make 1 ton of paper from fresh wood.
- One ton of paper made from recycled paper saves about 17 average-sized trees and 7,000 gallons of water.
- It takes more than a half-million trees each week to supply Americans with their Sunday newspapers.
- If each American recycled just 10% of the newspapers he or she reads, about 25 million trees would be saved each year.
- Recycling glass reduces energy costs for making new glass by close to 30%.
- Aluminum cans made from recycled aluminum saves up to 95% of the energy costs for making cans from new aluminum.
- Every minute in the United States, 113,000 aluminum cans are recycled.
- On average, each American uses 392 aluminum cans every year.
- About 63 billion (that's right!) aluminum cans are recycled every year in the United States.
- Every hour, 2.5 million plastic bottles are used in the United States.

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