INTERMEDIATE/
MIDDLE SCHOOL

REQUIRED SOFTWARE
◆ MICROSOFT EXCEL 97
◆ MICROSOFT POWERPOINT 97
◆ GREETINGS WORKSHOP or
   MICROSOFT PUBLISHER 97

DON'T TRASH THE EARTH

Teacher Guide

SUMMARY

In a hands-on environmental science project, students learn about recycling as they collect data on their own family's trash production, analyze the data with worksheets, chart the data, and present their findings.

OBJECTIVES

◆ To have students learn how to calculate simple worksheet formulas

◆ To collect and chart data from real-world settings

◆ To shape data into meaningful statements within a broader social context.

PREREQUISITE SKILLS

◆ Knows how to create a *Microsoft*® *Excel* worksheet and use functions

◆ Can create a slide presentation using *Microsoft*® *PowerPoint*®

TIME ALLOTTED

Approximately six weeks to three months

HOW TO BEGIN

Ask students how much they know about protecting the Earth's environment. We all know, for example, that pollution threatens resources. But do they know which resources? (The ocean, fresh water, air, etc.) How can over-use also threaten resources? (For example, extensive land development or over-timbering

U.S. TRASH PRODUCTION 1960-1990		
YEAR	**WASTE** **(million tons/year)**	**POPULATION** **(millions)**
1960	87	179
1965	104	190
1970	121	203
1975	136	214
1980	150	227
1985	166	238
1990	182	249

can threaten trees, soil, wildlife, and plant life.) In what way does household trash contribute to the problem? (In two ways: Overuse of resources, such as trees/paper; pollution from too much trash, which creates too much landfill; too many "non-biodegradable" products.)

Next, discuss recycling with your class. Why is recycling important and helpful for the future? Ask students to take a guess on how many pounds of trash they personally produce every year and have them share their guesses with the class. Tell students that in this activity they will find out how much

trash they and their families actually produce during a year, how much is recycled, and how much more might be recycled. Explain that in the "Don't Trash the Earth" project, students will weigh and, if possible, separate family trash into waste and recyclables, chart the results for three weeks, and analyze the data.

Send each student home with a copy of the reproducible at the end of this lesson, which explains the "Don't Trash the Earth" project to parents. Sign the bottom of the handouts, and ask each student to write his/her name in the blanks.

Student Activity

DESCRIPTION

In this activity, you will have the "honor" of taking out the household trash every night for a week. You will record the weight of the trash in a worksheet, chart the results for three weeks, and analyze the data. Finally, you will create a presentation about your findings.

STEP 1

Collecting the Trash

SOFTWARE: None

WHAT TO DO: Begin by telling every family member to "leave the trash! You will take it out."

If possible, set up a temporary Recycling Station at home for (1) glass; (2) metal cans; (3) no-deposit, non-returnable plastic bottles; (4) newspapers and magazines; and (5) returnable bottles. Be sure to have a separate garbage bag or container for each kind of recyclable.

STEP 2

Creating a Worksheet

SOFTWARE: Microsoft Excel

WHAT TO DO: Open *Microsoft Excel* and set up a "Don't Trash the Earth!" worksheet following Example 1. You will use this worksheet to record the weight of each category of trash each night. Print this chart out and post it close to where you keep the trash.

Every time you take out the family trash, you should weigh it and record its weight on the

Example 1: **"Don't Trash the Earth" worksheet created in *Microsoft Excel***

chart. A simple method would be to weigh yourself first, then weigh yourself again while holding a bag of garbage. NOTE: Even if you do not have a bathroom scale, you can figure out the aver-

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age weight of a garbage bag used at home. For example, a large (39 gallon capacity) garbage bag full of trash weighs about 7 pounds. Keep count of how many bags you dispose of each day and enter their total approximate weights on the chart.

At the end of three weeks, after all of your data has been collected, reopen your "Don't Trash the Earth" worksheet in *Microsoft Excel* and type in the data you collected.

STEP 3

Charting Your Data

SOFTWARE: Microsoft Excel

WHAT TO DO: Once your worksheet is complete, decide what data to graph. For example, you might compare your own individual trash production per year to the class average production or to the average U.S. citizen's trash production. You might also show the U.S. trend in trash production using the data in the chart on the previous page.

STEP 4

Presenting Your Research

SOFTWARE: Microsoft Powerpoint

WHAT TO DO: After you have created your charts, work in teams of four to create a presentation in *PowerPoint*. Consider the following areas for inclusion in your presentation:

◆ Research trash disposal and recycling locally and in the U.S. in general. Is recycling mandatory or optional? Is garbage disposed of in landfill? How much

Example 2: **Recycling flyer created in *Greetings Workshop***

does recycling help the environment? What kind of trash is not biodegradable? What happens to non-biodegradible materials in landfills? Can landfills or "dumping" pollute?

◆ Think of all the things that produce household trash. Is there anything we could change in society and in our families to produce less trash?

STEP 5

Start a Recycling Campaign!

SOFTWARE: Greetings Workshop or Publisher 97

WHAT TO DO: Begin a recycling campaign in your school or neighborhood with the title "Reduce, Reuse, Recycle" or come up with a title of your

own. Events surrounding the campaign can include a recycling awareness night or school rally.

Use Greetings Workshop to create invitations for the event and flyers to generate awareness of recycling issues as well as upcoming recycling events (see Example 2). Plan ways to effectively distribute these flyers so that they help people learn more about the issues. ■

SURVEY

Date _____

Dear Parent,

We are about to start on an exciting new project called,
"Don't Trash the Earth!" and we need your help!

All you need to do is to allow _____ to remove all of the trash
                                          STUDENT'S NAME
from your home for the next 3 weeks. No one else should dispose of it, because

_____ needs to weigh the trash before it leaves home. If possible,

allow _____ to set up some "recycling" garbage bags or bins. If

your family doesn't recycle, this trash should be separated at home, but can be

thrown out with other trash after it has been weighed.

"Don't Trash the Earth" is a project that will help teach your child some very

important skills. In a hands-on, real-life setting, students will learn how to apply pre-

calculus math skills and computer graphing skills, and will learn how to use spread-

sheets with Microsoft Excel. In addition, they will investigate environmental science

and learn about recycling.

The project will finish up with class presentations. We hope you will come to see

them!

Sincerely,

_____

P.S. If possible, set up a temporary Recycling Station at home for 1. glass, 2. metal

cans, 3. no-deposit, non-returnable plastic bottles, 4. newspapers and magazines,

and 5. returnable bottles. Preferably, students should have separate garbage bags

or containers for each kind of recyclable.