



Solid Waste Fact Sheet: An Analysis of Data*

Activity H.p
Grades 9 - 12

PURPOSE:

To acquire more knowledge about solid waste and use the information to develop a solid waste plan.

DIRECTIONS:

Read the information carefully. Complete the activities and answer the questions found in the reading. Garbage is rapidly becoming the topic of discussion in business meetings, political conventions, and even at the dinner table. Americans now place adequate garbage disposal third on a list of major local problems. No wonder, when every person in the United States produces 3.5 pounds of garbage per day. That's 160 million tons per year, enough to fill 2,700 football fields with a layer of garbage ten stories high! Although estimates vary, all researchers agree that solid waste totals are growing and they are estimated to grow more.

MONITOR THE SOLID WASTE YOU GENERATE IN ONE DAY. KEEP A RECORD OF THE ITEMS YOU THROW IN THE GARBAGE AT HOME, AT SCHOOL, AND AT RESTAURANTS. RECORD YOUR FINDINGS AND BE PREPARED TO SHARE YOUR FINDINGS IN GROUP AND CLASS DISCUSSIONS.

It is estimated that packaging and container waste makes up 30% of our discards, another 25% is nondurables such as newspapers and old clothing. Twenty per cent is yard waste, 14% is durable goods such as appliances and tires and 9% is food waste. The remaining 2% is miscellaneous inorganic wastes. The production of safe products requires products to be adequately packaged, but decisions must be made in the solid waste area that will protect the total environment for the protection of all living things. To better understand our garbage, review the chart which follows: **WHAT'S IN OUR GARBAGE?**

Amount (1986 data)	Paper and paperboard	Millions of tons	%
	Glass	64.7	41.0
	Metals	12.9	8.2
	Plastics	13.7	8.7
	Rubber & Leather	10.3	6.5
	Textiles	4.	2.5
	Wood	2.8	1.8
	Food wastes	5.8	3.7
	Yard Wastes	12.5	7.9
	Other	28.3	17.9
		2.7	1.7
		<hr/> 157.7	<hr/> 100.0

Source: Characterization of Municipal Solid Waste in the United States, 1960 to 2000; Franklin Associates, Ltd., 1988.

HOW DOES YOUR GARBAGE COMPARE WITH THE NATIONAL AVERAGE?

The problem of dealing with our solid waste must be addressed and rapidly. Fewer and fewer solid waste facilities exist to store an ever-growing amount of material. Like so many societal problems, waste disposal seems at first glance to be too large to have a solution. This is simply not true. Decisions can be made to solve the problem or at least to reduce its negative effects. To help you begin to realize the problem may have a solution, review the following chart: ***GARBAGE AROUND THE WORLD***

	Per capita lbs/day
Los Angeles	6.4
Philadelphia	6.8
Chicago	5.
New York	4.
Tokyo	3.
Paris	2.4
Toronto	2.4
Hamburg (Germany)	1.9
Rome	1.5

Source: National Solid Wastes Management Association, 1989.

DOES EVERY CITY AROUND THE WORLD HAVE THE SAME LEVEL OF SOLID WASTE GENERATION? WHY DO YOU THINK LOS ANGELES HAS SO MUCH MORE THAN ROME? HOW DOES YOUR FAMILY COMPARE WITH THE CITIES LISTED?

Currently, our nation deposits 83% of its solid waste in landfills, 11% is recycled and 6% is burned to generate energy.

FIND OUT WHERE YOUR COMMUNITY DUMPS ITS SOLID WASTE. DOES YOUR COMMUNITY HAVE A WASTE-TO-ENERGY FACILITY? WHERE IS YOUR NEAREST RECYCLING CENTER?

Landfills will not continue to be a viable solution for the bulk of our solid waste. Of the 6000 landfills operating in this country in 1988, 200 will close by 1993 causing an overall capacity loss of 56 million tons. This relative shortage of landfill space is causing the price charged to dump (tipping fees) to rise. Review the following chart to determine the tipping fee in your area:

TIPPING FEES BY SELECTED STATES

	\$/TON		\$/TON
Alabama	\$10.75	Minnesota	\$40.06
Arkansas	6.75	Missouri	13.00
California	10.00	Nebraska	8.00
Colorado	10.50	Nevada	6.00
Connecticut	35.00	New Jersey	41.97
Delaware	24.82	New York	40.00
District of Columbia	14.00	North Dakota	9.00
Florida	27.40	Ohio	15.51
Georgia	13.50	Oklahoma	12.75

Hawaii	13.00	Pennsylvania	25.00
Illinois	14.70	Rhode Island	49.00
Indiana	15.15	South Carolina	4.75
Kansas	4.07	Tennessee	7.05
Louisiana	9.75	Texas	9.35
Maryland	40.00	Virginia	24.00
Massachusetts	65.00	Washington	42.00
Michigan	26.00	Wisconsin	14.25

Source: National Solid Wastes Management Association, 1988.

WHY DO YOU THINK THE TIPPING FEES VARY SO MUCH BY STATE? WHAT IS THE TIPPING FEE IN YOUR AREA?

New landfills are difficult to start because of the "NIMBY" situation and environmental concerns. And, it is estimated that an environmentally safe landfill will cost 89 million dollars for a 100 acre facility. This price includes special holding basins, leaching fields, and the cost of returning the area to a pleasant and safe place for humans and animals.

GIVEN THE COST ESTIMATES AND YOUR KNOWLEDGE OF ECONOMICS, WHAT MUST HAPPEN FOR BUSINESSES TO BUILD NEW LANDFILLS?

Before our discussion continues, one issue must be addressed. It is that of litter. Many people think the litter problem and the solid waste problem are the same. For the most part, they are not. Litter is the careless or incorrect disposal of wrappers, soft drink cans, convenience food containers, etc. The act of littering forces other people to bear the cost of an unsightly environment, annoying insects, and hiring someone to pick up the litter. Solutions to this problem may be consistent with the solid waste solutions, but it is naïve to think solving the litter issue will solve the solid waste problem.

DID YOU SEE LITTER ON YOUR WAY TO SCHOOL TODAY? DID YOU LITTER? IF SO, WHY DID YOU CHOOSE TO, AND IF NOT, WHY WAS THAT DECISION MADE?

One solution that has been suggested to the litter issue is the creation of degradable packages, that is, packages made from material which will break down into simpler materials through exposure to natural forces such as bacteria or light.

Because litter is often exposed to the elements, using degradable packaging sounds like a useful solution. However, degradable packaging will not help the solid waste problem because landfills protect the garbage from the very elements that foster decomposition by covering it with layers of soil. In other words, whether a material is biodegradable or not, when it's put in a landfill not much biodegradation occurs. It should be noted, too, that businesses have to consider more than the litter and solid waste issues when designing packages. Durability, freshness, and safety must be considered as well.

WHY DOESN'T CREATING DEGRADABLE PACKAGES HELP THE SOLID WASTE PROBLEM?

The solid waste problem does not have an easy or single solution. Currently, comprehensive waste management plans include source reduction, recycling and composting, waste-to-energy incineration, and environmentally safe landfills.

Source reduction refers to changing both product and packaging to reduce the weight and volume of solid

waste. Procter & Gamble, for example, created their new Pampers and Luvs disposable diapers with an absorbent gel core which reduced their volume by 50 percent. Similarly, package volume was reduced by 80% by replacing cardboard cartons with plastic poly-bags. The company's decision makers realize the solid waste problem is real, and are committed to reducing and better disposing of solid waste. Successful companies of the future will be those which meet consumers' demand for "environmentally smart" products and packages. This is why many companies are currently research new and better ways to produce and package their products.

WHY ARE COMPANIES CONCERNED ABOUT THE SOLID WASTE PROBLEM? WHAT OTHER ISSUES MUST COMPANIES BE CONCERNED ABOUT WHEN DEVELOPING A NEW PRODUCT OR MODIFYING AN OLD ONE?

Recycling plays an important role in solving the solid waste problem. Review the following chart: **RECYCLING**

	Amount Generated (millions of tons)	Amount Recycled (millions of tons)	% of Total Waste Recycled
Paper and paperboard	64.7	14.6	9.2
Glass	12.9	1.1	0.7
Metals	13.7	1.0	.06
Plastics	10.3	0.1	0.1
Rubber and leather	4.0	0.1	0.1
Textiles	2.8	0.0	0.0
Wood	5.8	0.0	0.0
Food Wastes	12.5	0.0	0.0
Yard Wastes	28.3	0.0	0.0
Other	2.7	0.0	0.0
TOTAL	157.7	16.9	10.7

Source: Characterization of Municipal Solid Waste in the United States, 1960 to 2000; Franklin Associates, Ltd., 1988.

Essentially all reclaimable materials can be recycled. Technologies exist to process paper, glass, most metals and all types of plastics into useful new products. The economic advantages are obvious—new products and new markets, plus, materials that are recycled don't end up in the waste stream, thus reducing the burden to landfills and the resulting expense.

WHAT INDIVIDUAL, COMMUNITY, AND BUSINESS INCENTIVES ARE NECESSARY FOR A RECYCLING PLAN TO GROW AND BE SUCCESSFUL?

It is estimated that by the year 2000 17% of our solid waste will be burned to generate energy. This is an 11% increase from the waste-to-energy incineration currently being done. Although according to the Environmental Protection Agency, a waste-to-energy system should be considered as a preferred alternative to landfills, there are some concerns with this method of disposing of solid waste. One concern is air pollution. The generation of pollutants and their release into the air is now being effectively reduced or prevented by the air pollution devices built into modern day waste-to-energy facilities. Another concern is disposal of ash which is left with toxins that don't burn. When these ashes are buried, special care must be taken to prevent toxins from leaching into groundwater.

WHERE IS THE BEST PLACE TO LOCATE A GARBAGE WASTE-TO-ENERGY FACILITY?

Deciding what should be done to solve the solid waste problem requires a set of complex decisions which require assessing risks and weighing costs and benefit for society, the community, and the individual now and in the future.

DESIGN A SOLID WASTE MANAGEMENT PLAN FOR YOUR COMMUNITY.

Economics Glossary

Costs and Benefits: A process of decision making in which people select alternative(s) that maximize their satisfaction and/or minimize their unhappiness.

Decision making: The process of reaching a conclusion after consideration and acting upon that conclusion.

Environment: All external factors influencing the quality of life.

Marginalism: The process of decision making in which a comparison of added benefits and costs determine the course of action or decision.

Opportunity Cost: The value of the benefit given up by choosing one alternative rather than another.

Pollution (Externalities): The act of contaminating the environment which imposes negative effects on uninvolved third parties.

Risks: The chance of loss due to a particular event or decision.

Scarcity: The problem created by the limited availability of resources to produce goods and services and the unlimited desires for those goods and services.

*Source: Decisions About Product Safety: A Multi-disciplinary Teaching Unit, produced by Procter and Gamble Educational Services