

Equipped for the Future

Recycling: A Resource Booklet

Project writer

José Carmona

“Due to the high interest of the subject, students used the new vocabulary and were willing to converse in English language more often. Faculty and staff alike were amazed at how the students were talking about the project in their classrooms, the lab, etc. I normally thought projects like this one would take away from classroom time; however, students were meeting and utilizing out-of-class time more than expected. Students actively learned while pursuing this project.”

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Project-Based Lesson Plan I-10

Project Title: Recycling:	ESOL Language Focus: <input checked="" type="checkbox"/> Reading <input checked="" type="checkbox"/> Writing <input checked="" type="checkbox"/> Speaking <input checked="" type="checkbox"/> Listening Level(s): 4, 5, and 6
A Resource Booklet	
Florida Adult ESOL Course Competencies: 64.0, 81.0, 98.0 Environment and the World, specifically 64.03, 81.03A/B, and 98.02B and C 66.0, 73.0, 83.0, 100.0, specially 66.08/09/13, 73.02, 83.05/06/12, and 100.01/09/11/12	EFF Standards and Roles: Read/Write with Understanding Convey Ideas in Writing Use Info. & Comm. Technology Cooperate with Others Speak So Others Understand Reflect and Evaluate Listen Actively Learn Through Research
Classroom Activities/Procedures: (Project includes attachments) 1. Have students bring to class what they consider to be recyclable materials. 2. Have students discuss why some materials are recyclable and others are not. 3. Have students discuss how long certain materials last inside a landfill/in the world, for example: a. Orange and banana peels: up to 2 years b. Cigarette butts: 1 to 5 years c. Plastic bags: 10 to 20 years d. Tin cans: 50 years e. Plastic six pack holders: 100 years f. Glass bottles: 1,000,000 years g. Plastic bottles: Indefinitely 4. Answer the survey, How Friendly Are You to the Planet, in Discussion Starters (U. of Michigan, 1996, pg. 42). 5. Have students discuss the answers to the survey in small groups and then share with the class. 6. Have students research/find an article about garbage disposal, recycling, illegal dumping, etc. from the Internet, a magazine or a newspaper and share 10 new words with the class; summarize article and share own opinion.	Vocabulary: garbage plastic bottles litter plastic bags trash tin environment pollution recycling bins dump landfill solid waste aluminum
Developing the Resource Booklet and How to Begin Recycling at the School 1. Have two or three students visit Physical Plant/Custodial Office to determine if the school already recycles. 2. Have four to six students do more research about recycling and what is needed for a recycling program. 3. If the school has no recycling bins, have eight students make them and place them strategically in the building. 4. Have two students work on the cover. 5. Each student reports to the class after each assignment is completed. Booklet includes: starting a recycling program, article summaries, graphs, what each student learned, & references	Resources: Physical Plant/Custodial Office Local Solid Waste/Recycling Facility School and/or local library Articles researched by students Book listed in procedure See Reference List
Out of Class Assignment(s): 1. Research/find articles dealing with garbage, recycling, illegal dumping, etc. from the Internet, a magazine or a newspaper. 2. Call Physical Plant or the school unit handling garbage. 3. Call local Recycling/Garbage Dump to locate recycling bins. 4. Find other relevant information/drawings, etc. to place in booklet.	Materials Needed: 1. Recyclable materials such as: cans, glass and plastic bottles, paper/cardboard, etc. 2. Material to make recycling bins: cardboard, recycling signs, spray paint, etc. 3. Book listed above

Summary

- a) The project took three weeks, but not all of it was classroom time. As mentioned above, students worked on their own time quite often. The class met twice per week for 1.5 hours because these were advanced students; thus, a class that meets twice per week for three hours would be able to complete the project in much less time. Three entire class periods were devoted to the project: one to explain and disseminate student assignments (introduce topic, vocabulary, etc.), one to go over student assignments completed and to assess booklet progress, and the last one to go over last details on the booklet and to discuss what each individual person can do to help the environment. However, there was an allotted time of about 30 minutes per week (15 minutes of each 1.5 hour class) to discuss the shortcomings and successes of the project during the project. Please, notice that the project takes much less time to accomplish if students meet more than 3 hours per week.
- b) Some suggestions for completing project are:
1. Organize the project ahead of time in stages and possible time frames.
 2. Assign students who do not speak the same first language to each group as much as possible.
 3. Allow time for discussing problems/shortcomings at every class session while the project is in progress. This will maintain the momentum and help assess student involvement and completion of project.
 4. It will be very helpful to invite a local recycling facility's presenter or an environmental organization representative to speak to the class. This was not done at this time due to lack of classroom time to be devoted to the project.
 5. Relate project to established classroom curriculum. As an example, the environment was one of the three themes allocated to this course. This will also allow the teacher to complete required curriculum without feeling stressed for time.
 6. Give enough time for discussions about topic and for student reporting.
 7. Have students work at least in pairs since their comfort level with the language would be much higher.
 8. Utilize school and/or community resources to enhance the project. The school and/or local library are good sources of information.
 9. If computers and/or a lab are available, take students and show them how to use them correctly and to obtain information on the topic.
 10. Relax and let the students do it all; the teacher is merely a facilitator.

Unit 10

Exercise 10.7

How friendly to the planet are you? Take this test about the environment and you. For each item, write the number of your answer (given in parentheses) on the line.

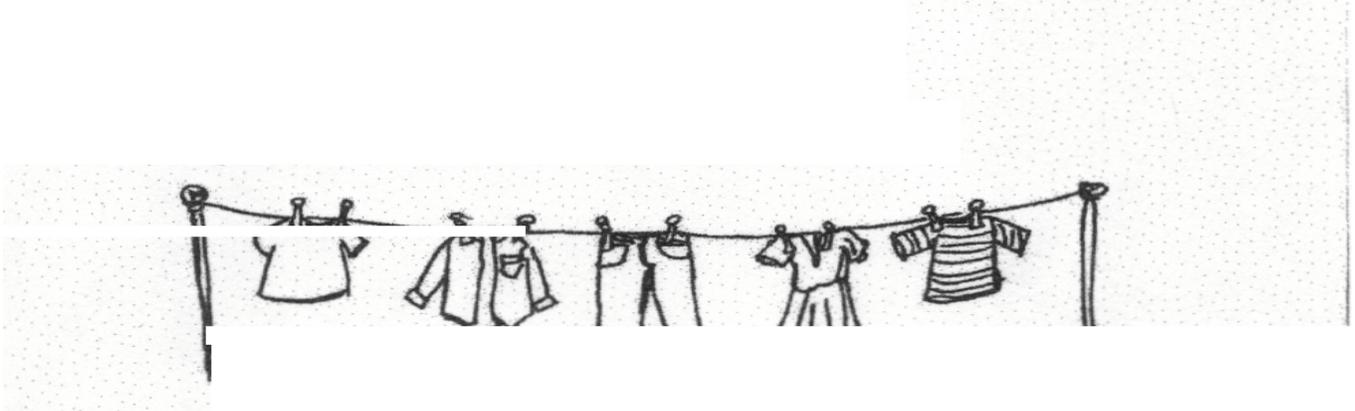
How Friendly Are You to the Planet?

1. When I have old clothes or old furniture, I usually _____
throw them away (3), give them away (1)
2. When I go shopping, I _____ take my own shopping bag to the store.
always (1), usually (2) sometimes (3), rarely (4), never (5)
3. I usually wash my clothes in _____ water.
hot (3), warm (2), cold (1)
4. In summer, I _____ run the air conditioner.
always (5), usually , sometimes (3), rarely (2), never (1)
5. My car gets _____ miles per gallon.
less than 20 (4), 20-25 (3), 25-30 (2), more than 30 (1)
6. I _____ recycle newspapers and magazines.
always (1), usually (2), sometimes (3), rarely (4), never (5)
7. My refrigerator is _____ three years old.
less than (1), about (2), more than (3)
8. My main method of transportation is _____
walking /biking (1), train (2), subway (2), bus (3), carpool (4), single car (5)
9. I _____ check my car tires to make sure they are properly inflated.
often (1), occasionally (2), rarely (3), never (4)
10. There _____ is a water--saving device in my toilet (such as a plastic
bottle which will displace water)
is (1), is not (3)

Survey :

Folse, Keith S. Discussion Starters: Ann Harbor, MI: U. of Michigan P., 1996.

11. In winter, I set the thermostat _____ than 70°.
higher than (3), right at (2), lower than (1)
12. I _____ make an effort to buy recycled goods when they are available
usually (1), sometimes (2), rarely (3), never (4)
13. I _____ try to recycle glass, plastic, and cans.
usually (1), sometimes (2), rarely (3), never (4)



14. I usually dry my clothes _____
on a clothesline (1), separately (lightweight separate from heavy clothing) in a clothes dryer (2), in a clothes dryer without paying much attention to light weight or heavy (3)
15. Most of the lights: in my home are _____
fluorescent (1), regular lighting (2)
16. I eat red meat _____ times a week.
5-7 (3), 3-5 (2), less than 3 (1)
17. When I have leftovers, I _____
eat them at another meal (1), throw them out (2)
18. When I drive on highways, I usually drive
over 65 mph (3), varying speeds (2), 55 mph (1)
19. I _____ use public transportation.
Usually (1), sometimes (2), rarely (3), never (4)
20. In my car, there _____ a bag for trash.
is (1), is not (2)

Survey :

Folse, Keith S. Discussion Starters Ann Harbor, MI: U. of Michigan P., 1996.

References

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World Watch Institute, 1992.
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- *Folse, Keith S. Discussion Starters: Speaking Fluency Activities for Advanced ESL/EFL Students. Ann Harbor, MI: U. of Michigan P., 1996.
- MacEachern, Diane. Save Our Planet: 750 Everyday Ways You Can Help Clean Up the Earth. NY: Dell, 1990.
- Naar, Jon. Design for a Livable Planet: How You Can Help Clean Up the Environment. NY: Harper & Row, 1990.
- *Survey included on pages I - 12 and I - 13 in Project I

Points to remember:

- Any recyclables you place in the regular garbage will not be recycled.
- Plastic bottles coded with 1 can be recycled in almost any city/town of the U.S.
- Plastic bottles coded with 2 and 3 can be recycled in many bigger cities/towns.
- In addition to aluminum cans, glass bottles, cardboard and paper, things such as plastic, tires, oil, paint, and methane gas can be recycled today.

Steps in Implementing a Recycling Program at Your School

If your school does not recycle at this point, it is necessary to begin as soon as possible. However, following the further steps can make the progress much easier.

1. Ask permission from school officials before starting program.
2. Contact Physical Plant or Custodial Office to make sure recycling is being done there.
3. Ask questions such as
 - a. Do you have separate recycling bins?
 - b. Do you separate the garbage once it is taken from offices, events, etc.
 - c. Does the cafeteria at the school recycle?
 - d. Are we allowed as a class/club to make

bins and place them around the school?

- e. How is our garbage picked up from the school?
4. Once having established these points, a recycling program may be started.
 5. Call local Recycling/Garbage Dump to find bins.
 6. If bins are not available,

according to Brazilian student José Campos, they can be made:

- a. Use a cardboard box.
 - b. Seal the bottom.
 - c. Spray paint the box in the desired color.
 - d. Place recycling signs on the sides using a computer: Recycle, Plastic Bottles Only, Aluminum Cans, etc.
7. Place a hole on top in the shape of the objects to go in each bin.
 8. Place bins in strategic places around the school.
 9. Begin small (only one building at a time).
 10. Educate people about recycling.



SAVE THE WORLD'S RESOURCES

What is Recycling?

by Ketulkuma Champaneri

Recycling is the collection, processing, and reuse of materials that would otherwise be thrown away. Materials ranging from broken glass to plastic spoons, from old newspapers to phonebooks can be recycled. The recycling process reclaims the original material and uses it in new products.

In general, using recycled materials costs less and requires less energy than using

new materials. Recycling can also reduce pollution by minimizing the pollution produced during the manufacturing process & decreases the amount of land needed for trash dumps by reducing the amount of discarded waste.

Recycling can be done internally (within a company) or externally (after a product is sold & used and returned by consumers for processing).

Inside this issue:

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Effects of Throwing Away Used Oil

By Junsuke Noda

- When it is released on land, used oil tends to migrate through the soil, stressing soil microbes and other small organisms. Loss of these organisms reduces nutrient cycles and can stress the plant foundation of the food chain.
- On water, oil spreads across the surface and eventually settles (as a tar-like substance) on the bottom. In both cases, plants, microbes, and invertebrates and other organisms become stressed as the oil clogs breathing mechanisms, interfere with temperature regulation and may accumulate in some tissues, such as muscle.
- Oil on water interferes with photosynthesis

and gas exchange at the surface, reducing oxygen levels.

- One gallon of oil can render one million gallons of fresh water undrinkable.



Dispose of properly!

- It may take up to 20 years for an aquatic system to recover from an oil spill.

Today, more than half of motorists change their own motor oil in the U.S. Each year, these people generate more than 200

million gallons of used oil. Most of that oil is disposed of improperly, for example, dumped in garbage cans, sewers or backyards. However, it can be recycled as industrial fuel, lubricants, jet fuel, home heating oil, and gasoline. We can help conserve oil and prevent pollution by taking these steps to prepare used motor oil for recycling:

- After draining the oil from our car's engine, put it in a clean plastic bottle with a lid that screws on tightly.
- Avoid plastic bottles once used for bleach, cleaners or automobile fluids such as antifreeze, because they can contain residues that contaminate the oil.
- Take your container of used oil to one of many designated collection sites.

Methane, a gas with 21 times the heat-trapping power of carbon dioxide, is a potent greenhouse gas and contributor to global climate change.

Benefits of Recycling Paper

by Anh Bui

1. Recycling paper reduces the total number of trees cut down to make paper and the demand for wood.
2. Producing recycled paper uses much less total energy than producing virgin paper.
3. Switching to recycled paper reduces greenhouse gas emis-

sions: By recycling, there will be less production of methane gas produced by the 80% of paper that ends up at the landfill.

4. Cuts emissions of other air pollutants such as nitrogen oxides (which contribute to smog) and particulates (which contribute to respiratory problems).

6. It also reduces the volume and improves the quality of wastewater from the paper mill.

In essence: Recycling paper helps preserve forests, conserves resources and generates less pollution during manufacturing, and reduces solid waste because it diverts usable paper from the waste stream.

The Nashville Paper Recycling Plant Development

by Bella Khamitsaeva

The Weyerhaeuser Company is a major integrated forest products company that restructured its paper recycling plant in Nashville, Tennessee in 2000.

A new high-speed automated optical sorting system for recycled paper was installed.

The optical sensors have the capacity to inspect up to 30 ob-

jects per second using integrated opto-electronic. The system can distinguish between white, off-white, colored, brown and gray papers.

This helps with the high cost of the previous methods of separating the waste paper entering the plant.

Manual sorting has been

costly in the industry.

Many people used to be employed to sort the different types of waste paper and many were also hurt in the process.

Sorting automatically is more reliable and reduces injury to the employees.



So much paper!
What to do with it?

Garbage and Air Pollution

by Hitenkuma Champaneri

1. Air pollution is the contamination of the atmosphere caused by gaseous liquid, solid wastes and human activities.
2. The incineration of garbage seems to produce the family of toxic chemicals known as dioxins. The dioxins are partly released from the smoke stack of incinerators, and they are partly retained in the ash, which is eventually sent to landfills.
3. How can chemicals from burning trash get into your food?
→ Smoke and ash can

settle on fruits and vegetables.
→ If ash is mixed into the garden soil, crops can take up chemicals.
→ Chemicals can enter milk, eggs or meat if farm animals eat contaminated feed or soil.

→ Ash (particulates) can irritate the eyes and throat and can restrict visibility. Ash can damage the lungs, cause bronchitis, emphysema, and lung cancer, and can seriously affect people with asthma or certain allergies. Ash also contains heavy metals that many seep into the ground water.



Don't Burn Garbage!

4. What are the effects of ash from burn barrels?

Smog is a common urban air disturbance. It causes haze as well as foul odors in the air. It is mostly caused by burning coal and fuel. In addition, it is found in most large cities as Los Angeles and New York.

"Mandates for particular recycling rates or recycled-content levels are unlikely to create environmental benefits."

Florida Recycling Policies Changed

by Sergio Sierra

According to Alexander Volokh and Lynn Scarlett in "Is Recycling Good or Bad -- Or Both," *Consumers' Research*, Sept. 1997, Florida had developed a disposal and recycling fees system: "...ADFs are a tax, added to the cost of a product, that incorporates the cost of disposing of that product when it is thrown

away" (4). Since poor families spend a higher proportion of their income in consumer goods, higher end ADFs of about 10 cents per package could have been equivalent to a tax increase of as much as 7.5%.

It was found that:

- a. ADFs didn't increase recy-

cling much.

- b. Recycling did increase in Florida and nationwide but not due to ADFs.

- c. The complexity of the real world is what made ADFs unworkable.

Efficient fees are very difficult to calculate for different products.

Make Your Own Products

by Hessa Alsowaidi

[Http://www.geocities.com/RainForest/5002/instruct.html](http://www.geocities.com/RainForest/5002/instruct.html)

There are many products you can make from your own plastic disposables.

1. Ball Carrier: a. Remove the net from an old soccer goal (or any other net); b. Cut a large circle from the good portion of the net; c. Weave a string or rope through the outer edge of the net to create a drawstring; d. Fill with balls.

2. Bird Feeder Molds: a. You will need the plastic packaging that chocolate Easter bunnies come in. They are in the shape of the bunny; b. Line the plastic bunny shape with wax paper; c. Mix honey or peanut butter with bird seed; d. Hang from a tree using an old shoelace.



Any other examples you can think of?

3. Cards from Valentine's Day Candy Boxes: a. Cut a heart-shaped candy box so that you have two flat heart shapes; b.

- Punch a hole in the top of each hump of the heart; c. Using a short piece of red yarn, tie bow at the top of each hump; d. Write a message inside.

Final Teacher Report

EFF Project-Based Classroom Project

Name: *José A. Carmona*

Institution: Daytona Beach Community College

Topic: Recycling: A Resource Booklet

- 1. Explain how the project improved your students' English language acquisition? Which activities were most helpful?**

There is something about seeing their name in a publication that attracts students very rapidly to a project. Students became much more active participants as speakers and listeners in the classroom. They brought in the researched information and readily shared it with the class and were more willing to listen to what others had found. Due to the high interest of the subject, students used the new vocabulary and were willing to converse in the English language more often; in many instances, this specialized vocabulary doesn't readily translate to students' native languages; therefore, students foresee the need to express themselves solely in English. Having to put into words what their jobs were made students think critically in English, for example: students creating the recycling bins needed to write down the process for the booklet.

One of the most helpful activities was to have students research on their own. They felt they had enough time to read, interpret their findings and internalize the specialized vocabulary in order to deal better with the subject. A second activity that was very helpful was to take the students to the school library for a one-hour presentation from a librarian on researching the Internet as well as the online programs and library holdings available to research the topic. Students felt more confident about researching a complex topic after receiving guidance from their librarian. Using the survey, *How Friendly Are You to the Planet*, in *Discussion* (U. of Michigan, 1996, pg. 42) was very helpful in having students assess what they were actually doing or not doing to help our environment. Bringing recyclables to the classroom was also helpful for the students were able to see the difference between recyclable plastic bottles coded 1 (pete), 2 (hope), and 3 (v) for example.

2. How was student attendance impacted by the project? Explain.

Student attendance improved almost to 100%. The students, who would rarely come to class, came prepared and on a daily basis. For this to happen, the project has to be identified and run as a whole depending on its parts to function. That is, students were told that if they would not do their part, the project (the final booklet) would not be accomplished. Having them complete pieces of the project outside of the classroom provided students with more time to reach a goal. In essence, the students felt empowered to develop something of their own to share with others.

3. Describe how the students organized to accomplish team goals.

Students met in class and outside of class. Many used the classroom as their home base. They would come to class prepared with their accomplished goals and leave the classroom to accomplish the next goal. In addition to meeting at the library and the lab, some students went as far as visiting each other to meet and carry out their goals.

4. Would you initiate another project-based activity in your class? Why or Why not?

Definitely! Faculty and staff alike were amazed at how the students were talking about the project in their classrooms, the lab, etc. They seemed to have enjoyed taking the theory and putting it into practice by setting up recycle collections around the building. I normally thought projects like this one would take away from classroom time; however, students were meeting and utilizing out-of-class time more than expected.

5. Additional comments on the project and its impact on students.

Students actively learned while pursuing this project. Many commented on becoming more active participants recycling and helping the environment as a whole.