Carlos Pascua Zúñiga High School

Guide for Improving Student Attitudes toward Recycling

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Faculty of Carlos Pascua Zúñiga High School,

We are students from Worcester Polytechnic Institute in Worcester, Massachusetts in the United States working on a project in Costa Rica to help attain our degrees. We have conducted research in your high school about the students' attitudes and behaviors in regard to recycling as well as their perceptions about their role in the community. We used observations around the school as well as surveyed 100 students and interviewed 30 students and 9 faculty members. We would like to present you with this guide as a resource to communicate our findings as well as suggestions for activities to improve students' attitudes about recycling.

We hope that this guide will help you to incorporate recycling into your lesson plans without needing to design activities on your own. The purpose of these activities is to create a sense of ownership in the students as well as foster a lasting change on student behaviors and attitudes about their personal environmental impact. The activities range from long term projects to short activities that can be completed in one class period or less.

If you have any questions or comments, please email the four of us at cresph@wpi.edu without hesitation. Also, if any students would be interested in talking with us, feel free to give them our contact information as well. Thank you so much for your time and we hope that this project will be of use to you and your students.

Sincerely,

Meaghan Busteed

Kushal Palkhiwala

Melissa Roma

Bhavika Shah

Blue Flag Initiative

The purpose of the Blue Flag program is "to encourage non-coastal communities to organize themselves in an effort to protect natural resources, tourist attractions and so provide a better quality of life for local people and visitors to the participating communities."

Importance to the High School

- Improves the status of the high school
- Increases the sense of pride
- Creates a healthier and cleaner environment

Achieving this status will bring your community recognition for your ecological efforts

How does this relate to the students?

- Involves the students in a greater community effort
- Gains recognition for student efforts
- Improves the student role in the community

20% of the evaluation criteria is based on environmental education

How can the High School help achieve this status?

- Increasing participation in environmental efforts including the recycling program
- Increasing environmental education especially about recycling and waste management
- Cleaning the school and making it a more attractive place

Why Recycle?

Because when we make products from recycled materials instead of always using new raw materials we:

- Save natural resources
- Save energy
- Reduce disposal costs
- Reduce harmful emissions to our air & water
- Save money & create jobs

Recycling Resources

English:

http://www.grrn.org/resources/recycling.html
http://recyclingweek.planetark.org/kids-teachers/
http://www.recyclezone.org.uk/tz_resources.aspx
http://www.atozteacherstuff.com/Themes/Recycling/

Spanish:

http://www.costaricareciclaje.com
http://www.redcicla.org/
http://www.efdeportes.com/efd87/rural.htm

Get to Know Your Students!

97% of surveyed students understand the consequences of NOT recycling.

Common Themes

Most students….

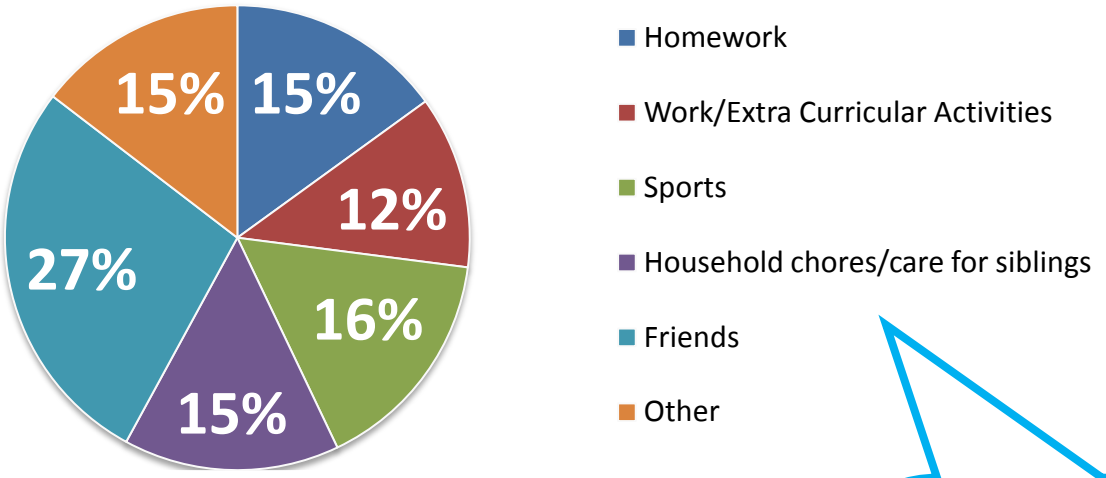
- **Only** recycle for incentives
- **Understand** the consequences, but do not act on them
- **Do not** feel like respected members of the community
- **Are** interested in learning more about the environment
- **Recycle** only when it's convenient

"They have learned the consequences of not recycling, but they think that their small amount of trash is not going to make a difference; they are not seeing the big picture."

- Teacher

100% of interviewed students only recycle for extra credit points in their classes.

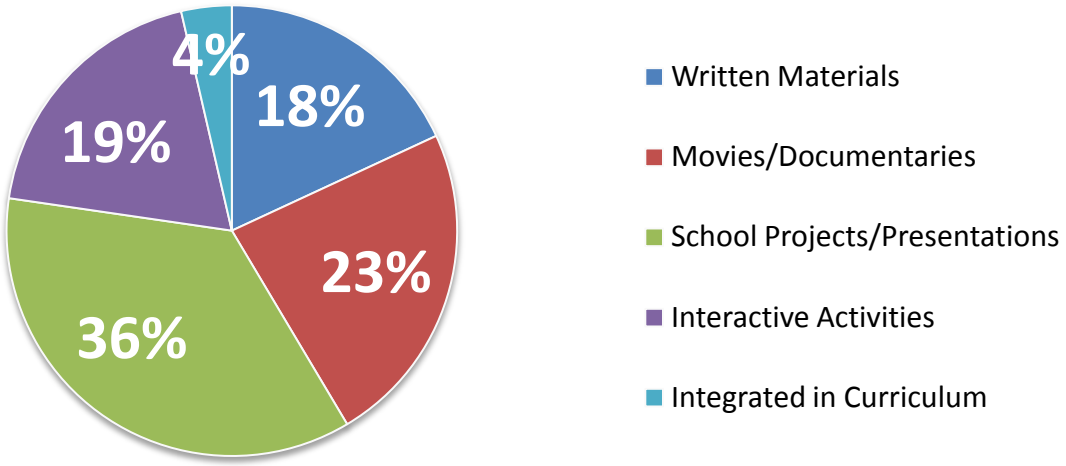
Time Spent Outside of School



Students like projects, presentations, movies and documentaries so try and incorporate that into your lesson plan.

It is important to relate to students on a personal level and consider the activities they enjoy! Try doing more group activities since they like spending time with their friends.

Preferred Methods of Environmental Education



Supporting Research Facts

Effective Teaching Strategies

Active Learning	• "They must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives."
Diverse Learning Methods	• "Students need the opportunity to show their talents and learn in ways that work for them."
Cooperation Among Students	• "Good learning, like good work, is collaborative and social, not competitive and isolated."
Student-Teacher Contact	• "Frequent student-faculty contact in and out of classes is the most important factor in student motivation and involvement."
Deeper Meaning Education	• "Research has consistently found that meaningful processing strategies lead to greater performance on achievement measures over the material studied than shallow strategies."
Relevant Information	• "Teachers should describe their different learning activities to students in terms of how they are meaningful and relevant to students' interests, goals, and needs."

Introduction to Activities

The activities on the following pages are meant to help save the time and energy it would cost teachers to initiate them on their own. They have been designed to incorporate all previously mentioned educational techniques while also involving the students in the initial steps of the recycling program. This is so that the students will feel that they have a sense of ownership on the program which will increase their motivation to improve it further. Activities have been assigned letters from the legend below that designate which subjects they would be best suited for. We hope that implementation of these activities will promote a long lasting effect on the students motivation to recycle as well as their perceptions about environmental impact. The activities have also been labeled for the amount of time needed including in class activity, overnight homework assignment or long term activity. The last box under each activity describes the reasoning behind its design as well as its potential effect on the students' recycling attitudes.

Legend for Subject Specific Activities

M = Math

E= English

S = Spanish

SC = Science

PE = Physical Education

IT = Information Technology

SS = Social Studies

R = Religion

A = Art

G = General

This symbol designates which activities may help the school attain the Blue Flag Status.

School-Wide Efforts

Recycling Week

- Dedicate one week to raising awareness about recycling. The main event during this week could be a weeklong competition between classes in which students bring in recyclables from home and the class with the highest amount wins a prize. Such an event would help bring the students together and increase participation through competition. Even though incentives are not the only way to get students involve this would be a good annual event to constantly increase participation and awareness throughout the school.

- Other good activities mentioned later to include in this week are:
  - Announcing Recycling Facts
  - Art Fair with Awards or Science Fair
  - Wear Recycling Facts or Statistics

Recycling Club

- Organize a group of students that meets regularly to discuss the recycling program and further our efforts.
- Recognize their efforts as a contribution to attaining the Blue Flag Status.
- They would be responsible for the collection and separation of materials from bins.
- This will provide an opportunity for students to work with their friends to better their school.
- The club could create a logo that is visually appealing to students. This logo could appear on all recycling bins and posters to increase awareness about the club.
- On the suggested activities we have indicated which ones would be good for the recycling club to implement with a ***RC*** under the title.

Activity Ideas: Writing

Recycling at Home Journal

E, S

Long-term

Students could keep a journal on the recycling status of their family habits.

If they do not recycle at their homes they should try to start recycling and log their recycling activity.

This will help get parents involved as well as get kids to think more about the deeper reasons of recycling.

Story about the Life of a Recycled Object

E, S, SC, IT

Homework

Students could research the life span of a specific recyclable material as well as a non-recycled object.

They would then write a short story comparing the two that could be read to other students to improve their awareness as well.

This would promote deeper meaning education as well as active learning to better their understanding of the processes that occur once an object is disposed of as well as the consequences and benefits of their actions.

Articles to the Town Newspaper

E, S, SS

Homework

Students could write an article to the town or canton newspaper. Perhaps a program could be started where students submit one article every week.

Their articles could explain any recent environmental efforts or projects completed in the high school as well as the community.

This will improve writing skills, raise awareness and help students feel like a part of the larger community.

Activity Ideas: Art

Art Fair with Awards

A, RC

Long-term

Have students make a craft from recycled materials.

They can display their art around a fair and explain the materials they used. Prizes could be awarded to the most colorful design, most creative design, etc.

This idea incorporates active learning to capture student interest in the topic. Reusing the materials to create something new and interesting may spark student desire to recycle.

Recycling Songs

E, S

In-Class

Students could work in groups to write lyrics about recycling for a new song or to a tune they already know.

Lyrics should discuss the positive and negative consequences of recycling rather than throwing an object in the trash.

This would promote deeper meaning education as well as active learning to improve the students understanding of the implications of their personal actions.

Mural Painting Around the School

A, RC

Long-term

Have students paint murals around the school about environmental topics.

Students could research topics for the mural. They are already interseted in painting and art so this activity may be more enjoyable.

By doing the research themselves students might gain deeper knowledge about the enviromental problem. They may also feel pride when seeing their work around the school.

Activity Ideas: Community

High School & Community Pick Ups

G, RC

In-Class

Organize a time for the class to pick up trash from public areas around the school and community.

The students will enjoy the activity as it is a social way to participate in environmental events and help the larger community.

This contributes to an overall sense of belonging in the community as well as shows visible results that the students can be proud of.

Interview Community Members

G, RC, SS, S

Homework

Students can interview community members on recycling habits as well as their perceptions about the Blue Flag initiative.

Students could discuss common findings with the class.

This will help to build relationships in the community and give the students a broader perspective of environmental concerns

Public Display Activity in the Park

G, RC

Long-term

Have students research an environmental topic of interest and create a way of displaying it (poster, brochure, etc.)

Students can display their work in a public part of town and distribute green ribbons to wear for environmental awareness.

This is a way to show the community that students do care about the environment and want to involve the community

Activity Ideas: In Class

5 Minute Trash Pickup

SC, M, G

In-Class

Students have 5 minutes to collect as much litter as possible aorund the high school campus.

In class they can examine their findings and have a discussion about what kind of trash is being generated and what can be recycled.

This activity can help make students more conscious of their waste disposal habits and demonstrate the benefits of a cleaner campus.

Recycling Show and Tell

E, SC, G

Homework

Students can bring in a recyclable material from home and research the potential re-uses for that item

Students can share what they learned about their item by having a class discussion.

This activity involves students and also families in identifying the kinds of waste generated and the benefits

Recycled Gift Giving

A, G

In-Class

Students can bring various items from home (i.e. newspapers, magazines, bottles, paper) to make into a gift.

Some gift examples include collage of magazine pictures, milk carton birdfeeder, picture frame, mask, and holiday cards.

This is a way to diversify the way students learn about the benefits of recycling in which they can incorporate their artistic abilities and interests.

Activity Ideas: Recycling Facts

Wear Recycling Facts or Statistic

E, SC, G, M, IT

Homework

Ask students to research a recycling fact or statistic that means something to them personally.

Then, go around the room the next day and have students explain their fact. Request that students wear the facts on a blue or green patch on their clothing for the day.

This incorporates active learning and deeper meaning education. Also, students could learn collaboratively by discussing their statistics with their friends.

Recycling Fact Scavenger Hunt

SC, G, IT

Homework

Split the class up into two or three groups. Each group would research facts or statistics about recycling that they felt were important.

Have the students convert the facts into open answer or true/false questions that could be used in competing scavenger hunts between groups where students would receive clues for correct answers.

This incorporates active learning and deeper meaning education as well as student/ teacher contact. It could also provide a fun atmosphere for students to learn with their friends.

Announcing Recycling Facts

SC, G, RC, IT

In-Class

Each day through the PA system,students could make announcements stating facts about environmental conservation and recycling.

These facts should be drastic and relevant to the student's interests.

This would serve as a constant reminder to increase students' consciousness about their actions. This would incorporate active learning.

Activity Ideas: Acquiring Resources

Acquiring Collection Bins

IT, RC

Long-term

Ask students to contact companies listed in **Appendix B** and inquire about possible collection bin donations.

Have the students compile their resources and decide together where in the school they should be placed and physically put them there.

This provides a collaborative activity where students could create a sense of ownership in the recycling program which may improve their pride and responsibility for it.

Publicity Around the School

A, RC, SC, S, R, IT

In-Class

If students are able to attain collection bins, spend a class period having students decorating them to make them more visually appealing and noticeable in the school.

Have students use recycling facts or pictures of Costa Rican resources that they want to protect. Try to have students decorate with something meaningful to them or their friends.

This provides active learning, deeper meaning education, and student-teacher contact. It could also give students a sense of ownership in the program as well as give them more contact with the community.

Decorating Collection Bins

A, RC, SC

Long-term

Have groups of students research topics such as the positive or negative effects of recycling participation, the life cycle of a recycled object or trash, the recycling initiatives in Costa Rica or San Rafael, or the process of recycling.

Have students create a poster of their work that could be presented to the class as well as displayed around the school, especially near recycling bins. This could help other students increase awareness as well.

This incorporates active learning, deeper meaning education, and may help to create a sense of ownership in the program. It is also a collaborative research project, which students expressed interest in.

Activity Ideas: Games

Calculating Landfill Use

SC, M, G

In-class

Have students calculate the amount of space their family uses in a landfill each year based on how much trash they generate using the the estimation formula used in **Appendix A**.

Then determine the amount of space in a landfill the class and their families use per year and generate a discussion based on the results

This activity will show students how much waste is generated per year by their families and prompt students to think critically about the consequences of filling up space in a landfill.

Bottle Bowling

PE

In-Class

Using 2-liter soda bottles create a set of bowling pins. Put an inch of sand in the bottom of the bottle so they bottles do not fall down very easily.

Student teams are responsible to gather as many plastic bottles as they can that the other teams have to knock down.

This will help students participate in recycling in an engaging manner (active learning) and generate excitement towards bringing in recyclables in class.

Recycling Relay

PE

In-Class

Place a recycling bin and a trashcan at the end of three lines (for 3 teams). When the game starts a member of the team has to pass trash down the line and identify whether the material is recyclable or not.

The last person in the line has to separate the material into the correct container. The team with the most items in the correct container will win.

This activity uses active learning to teach the students about the process of recycling and separation. Students can realize that recycling can be a fun group effort.

Activity Ideas: Research Projects

Blue Flag Program Poster

SS, IT, S

Homework

Using the following website: http://www.munisrh.go.cr/bandera_azul.htm have students create posters on what they could do to aid the town in attaining the Blue Flag.

The posters could then be hung up throughout the school to add to the visual appeal of the hallways.

This activity would help the students gain insight into what they could be doing to attain the Blue Flag program which may lead to a sense of ownership in the program

Science Fair

SC, S, R, IT

Long-term

Assign environmental research projects , especially about recycling. Project topics could include: The Benefits of Recycling, Energy Conservation, Water Contamination, etc.

Have students create posters that can be presented in an open space. Best projects could receive a prize.

Self learning will help students retain information and learn at a deeper level which could motivate them to learn more about the topics.

Benefits vs. Cost Debate

SS, SC, R, IT

Homework

Separate the class into two teams. One side should be instructed to conduct research on the benefits of recycling and the other on the cost of recycling.

Using this information the students should have an organized debate about the topic. The teacher can be a mediator to make sure the debate does not escalate

This activity will promote passion towards the subject of recycling and will aid the students in learning about the issues of recycling at a deeper level.

Sister School Program with Nashua High School South

The idea of this program is to have written communication between the students of Carlos Pascua Zuniga High School and a school in the United States. This program will help the both groups of students improve their language and writing skills as well as learn something about another culture. The students at Nashua High School South can provide ideas for environmental and recycling activities while the students at Carlos Pascua Zuniga High School can help them improve their Spanish as well as learn about the Costa Rican culture.

Dear Carlos Pascua Zuniga High School,

My name is Marianne Busteed and I am an Assistant Principal at Nashua High School, in New Hampshire, USA. We are very excited to start a relationship between our high school and yours. We hope that the start of this program will provide a cultural exchange where students can better their language skills as well as learn about environmental efforts in another country. Our goal is to provide a helping relationship between the students that can foster new ideas and growth. Best of luck in the future.

Sincerely,
Marianne Busteed

Dear Carlos Pascua Zuniga High School,

My name is Kinjal Shah and I am a student in 11th grade. I am a part of the Recycling Club at Nashua High School and also our Spanish Honor Society. I am excited to start this program with your school. The students at my high school will be able to offer many environmental project ideas. We will also enjoy learning about your student's high school and the Costa Rican culture. Below is my contact information via email as well as the information for the two teachers that oversee these clubs. Thank you for your time and I look forward to speaking with you soon.

Sincerely,
Kinjal Shah

Kinjal Shah: kinjal15@yahoo.com

Acknowledgements

We would like to thank our sponsors Doña Katia Matamoros and Don Fernando Matamoros for all their help around the town and our professors Ingrid Shockey and Isa Bar-On for their guidance through this project. We would also like to thank Jimmy and Marcela Music for their continued support through this process. Finally we would like to thank our friends Beatriz Gutierrez, Emanuel Jimenez and Silvia Velasquez for helping with the translation of this guide.

We hope that our guide will be a useful tool for the faculty of Carlos Pascua Zúñiga High School. We enjoyed working with your school and experiencing the Costa Rican culture.

Best of luck with everything in the future!

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Appendix A: Calculating Landfill Use Activity

Your Slice of the Landfill Pie

Most adults create about 2.3 kilograms of garbage each day and most children (under 12) create about 1.8 kilograms each day. Complete the calculations below to determine how much space you will need at the landfill for your family's trash for one year.

Have students determine the number of kilograms (kg) of garbage their family generates in one year.

Number of adults in family____ X 2.3kg. = _____kg. per day/ adult.

Number of children in your family _____ X 1.8 kg. = _____kg. per day/child.

Adults kg. _____ + _____ children kg. = _____family kg. per day.

Family kg. per day _____X 365 days a year = _____family kg. per year.

Calculate how much space will be required at the landfill for a year's worth of your family's trash**.**
(Each 592.8 kg. of material requires one cubic meter of space at the landfill.)

Family kg. per year _____ divided by 592.8kg.= _____ cubic meters per year.

Calculate how much space will be required for a year's worth of garbage from all of the families in the class.

Website: www.resourcefulschools.org

Appendix B: Recycling Companies Contact Information

Codiplas S.A
800 mts N. de la Iglesia, Barva carretera San José de la Montaña
Telefono: (506) 2363 6911
Email: codiplas@yahoo.com
Ingrid Lourdes Mazariegos/Gerente General

Delmondo S.A.
50 m E., 5 cuadras N. y 25 m O. del Colegio de Ingenieros, Urb Freses de Curridabat
Telefono: (506) 2253-6086
Fax: (506) 2224-4436

Gente Reciclando S.A.
Ochomongo Zona Industrial frente a Recope
Telfax: (506) 2537-3809

Manejo Profesional de Desechos S.A.
Ochomongo Zona Industrial frente a Recope
Telfas: (506) 2537-3809

Recicladora Ambiental de Costa Rica
200 m O. y 25 m S. de Fotolit B^0 Cuba
Telefono: (506) 2221-7935
Fax: (506) 2573-3678

Reciclados Plasticos Industriales, S.A.
Freehold, Siquierres- Limon, 200 m E. de la Subestacion del ICE
Apartado: 120-7200
Telefono: (506) 2765-8206
Fax: (506) 2765-9900

Recuperadora Nacional de Plomo, S.A.
100 m E. y 400 m S. del Motel la Fuente, B^0 San Jose- Cuirridabat
Apartado: 93-2300
Telefono: (506) 2272-0561
Fax: (506) 2272-3447