Recycling at School: An Action Project

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Abstract

While many of us assume that recycling is now entrenched in our 21st century culture, analyzing recycling bins in public places, such as schools, quickly dispels that notion. This article describes an action project completed by 5th grade students in New York State as they focused their attention on their school's recycling bins and worked to increase recycling behavior in their school community. Students first collected photographic evidence of the use of recycling bins in classrooms and then used a variety of methods to educate fellow students on the importance of recycling. Two months later, they collected additional photographic evidence of bin use, and saw an increase in the number of bins used correctly. Students concluded that recycling behavior can be increased through education.

Introduction

In late 2017 the NOAA Climate Stewards Education Project changed its title to the NOAA Planet Stewards Education Project.

To become a NOAA Climate Steward, I was asked to complete an action project that would involve my students taking steps towards mitigating climate change. In return, I would receive free professional development in climate science, funding for school projects and conference attendance, and support from climate experts at NOAA (National Oceanic and Atmospheric Association). Little did I realize at the time of joining that I would continue on with the NOAA Climate Stewards Education Project, becoming a mentor to new members, and a continued presence in this powerful network of formal and informal educators who are working to get climate science into the schools, and engage children in environmental stewardship.

For my action project I focused on recycling in my school. There are recycling bins throughout the building, but as is often the case, they were often not being used correctly. With that in mind, the stage was set for my students to discover the problem, educate themselves about recycling, and take action to affect change. As far as my students were concerned, the goal of our project was to see if our school community was recycling correctly. Once answered, the goal became to determine if it is possible to alter recycling behavior through education. Additionally, my goal was to introduce my students to basic scientific data gathering and methodology, and the art of effective dissemination, while heightening their own awareness of the importance of recycling. This project involved two classes of 5th graders but would have been just as effective in middle school or high school.

As part of our Earth Science Unit (NGSS Earth and Human Activity), my students discussed ways in which humans impact Earth's systems (ESS3.C). They brainstormed ways to reduce air pollution to mitigate climate change. They researched online (see Resources for a link to a list of child-friendly websites). And they visited the local recycling center, learning that it takes less energy to re-make an item out of plastic, glass, metal, or paper than it does to manufacture it from scratch. They concluded that recycling to help the environment was a no-brainer. That led them to wonder: *Is our own school community disposing of trash properly, that is, in an environmentally friendly way? Are the school's recycling bins being used correctly so items can be recycled?*

My students set out to find the answer. Once they determined that the bins were often not used correctly, they worked to alter the community's behavior. The aim was to increase the recycling behavior of the community. They looked at trash in each type of bin (trash bin or recycling bin) as proxy evidence for recycling behavior. They gathered baseline data, worked to educate the school community, and then collected additional data to see if the bins were now being used correctly more often.

Methods

My students collected baseline data by photographing classroom trash bins and recycling bins in random classrooms around the school. This was done once a week, at the end of the school day, for three weeks. I had emailed all the teachers ahead of time, letting them know that my students would be photographing bins as part of a class project. I asked them not to discuss it with their own students yet. If their students asked, they would just tell them it was for a project for one of the other classes. I assured teachers that we were not interested in any individual's results, and that there would be no identifying features in the photographs. We were only interested in the aggregate results. Students took one photo of each bin in each classroom, pointing the camera straight down into the bin (Figure 1). They did not photograph any bins that were empty.

Figure 1. Student gathers photographic evidence to determine if the recycling bin is being used correctly.

My students analyzed this photographic evidence at the end of three weeks. I projected each photograph on the Smartboard. We could distinguish bins by their color. All paper recycling bins in our school are blue; all hard, plastic recycling bins are green; all trash bins are grey or black. The children tallied all bins that had correct items in them: only paper products in the paper bin, only hard, plastic bottles (with no water in them) in the plastic bin, only non-recyclables in the trash bin. If there was even one incorrect item in the container, the tally mark went into the column showing that it was not being used correctly.

We discovered that out of 50 usable photos (some were so blurry that they were unusable), 14 pictures showed the bins had been used correctly (paper in the paper bin, empty plastic bottles in the bottle bin, garbage in the trash bin). That meant that only 28% of the bins were being used correctly on a typical school day. While analyzing the photos, it became clear that even my science students were confused about the correct use of recycling bins. Common misconceptions: it's alright to put partially filled drink containers in the plastic recycling bin if the lids are on; tissues and paper towels go in the paper recycling bin; paper plates with food on them go in the paper recycling bin.

Using this as our baseline data, the students brainstormed ways to increase recycling at school. They hypothesized that if students were taught how to recycle properly, and understood the importance of recycling, they'd dispose of their trash properly (in an environmentally friendly way) at school.

Figure 2. Students created posters to hang in the school hallways to encourage recycling.

Brainstorming and planning during science class, and after school on their own, the children came up with a number of ways to help educate the student community about recycling. They designed posters, which they mounted in the school hallways (Figure 2). They wrote "Public Service Announcements," reminding students to recycle properly. Individuals read these over the intercom to the entire school once a week for two months. They talked to students around the school about the importance of recycling. They created amusing, educational skits about recycling properly, which they performed at a school-wide assembly. They had a family member photograph them at home recycling and performing other actions that would demonstrate environmental stewardship. Parents emailed the photographs to me, and I uploaded them to make Animoto videos, one for each of my two science classes. (See Resources.) The videos were also shown at the assembly. Our goal was to educate the student community about recycling, while also adding a bit of societal pressure, making concern for the environment seem cool, and recycling the right thing to do. Children have the ability to achieve this in a way that is unattainable by adult presenters.

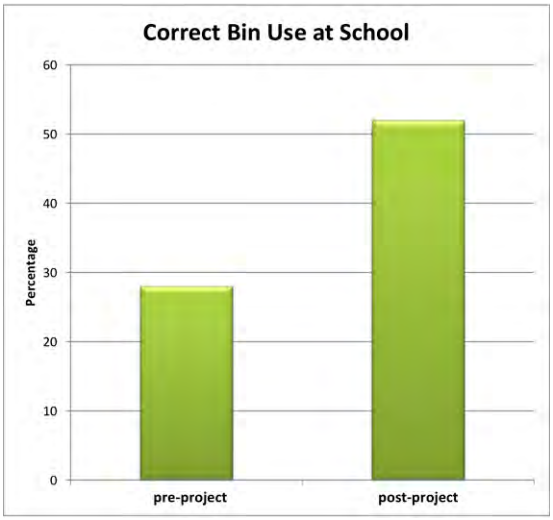

Figure 3: After educating the school community, 52% of the trash and recycling bins were used correctly, compared with only 28% used correctly before the start of our recycling action project.

Results

Two months later, my students again photographed bins around the school for three weeks, accumulating another fifty usable photographs of classroom bins. Did their actions make a difference? Did they affect change in the recycling behavior of our school community? Analyzing the photographs, the students tallied the number of bins that had been used correctly, and those used incorrectly. The criterion was the same: if even one piece of trash in the bin was inappropriate for that bin, the children had to consider the bin used incorrectly. This time, out of 50 photos, 26 showed the bins had been used correctly; 24 incorrectly. That is, 52% of the bins were used correctly, up from 28% before the students' recycling campaign (Figure 3).

Discussion

We celebrated that there had been a marked increase in correct recycling at school. At the outset of this action project, we had hoped that after educating the school community there would be close to 100% of the trash bins and recycling bins used correctly. While we were disappointed that the results indicated only 52% were being used correctly after our education campaign, we concluded that the evidence of change from 28% to 52% of bins used correctly showed that my students' dissemination of information, and their acting as role models of environmental stewardship, had significantly increased the recycling behavior of our school community.

Anecdotal evidence also showed that my own science classes developed an appreciation for the scientific methodology. They were able to explain the need for quantifying information in order to

measure change. They demonstrated an understanding of the importance of recycling. In class, they discussed what they saw in bins around the school, expressed their dismay at egregious offenses against responsible disposal of waste, and excitedly planned creative ways to educate the community. They also, voluntarily, worked on posters, skits, and an Animoto video outside of class time. Additionally, their own heightened awareness of the importance of recycling meant that my own classroom recycling bins were now being used properly by students every day.

Class discussion provided insights into probable reasons why there wasn't higher compliance of correct waste disposal. We concluded that habits are difficult to break, especially one that is as automatic as throwing away a piece of trash. However, measuring positive change in behavior during the limited time of our action project suggests that additional repeated encounters with the recycling message and societal pressure would yield additional increases in recycling behavior. This was a simple action project designed for elementary students in the 5th grade. I would welcome information from middle school and high school teachers who replicate this project with older students in a larger school, and, if possible, over a larger period of time with more recycling education for the students.

Note that we did not count or weigh the recyclables, as has been done in other action projects involving students. That data would be irrelevant to this study. We were not looking to generate more recyclable trash, nor less garbage. Our goal was to have people categorize their waste correctly, no matter how much or how little, so they would become conscientious recyclers at school. People don't like to think of themselves as being hypocritical, so there's reason to think that if they understand the importance of recycling to the degree that they actually recycle correctly at school, they will also recycle at home.

Conclusion

I once attended a presentation by Alan Alda, early in life a famous actor (think M.A.S.H.), and now, later in life, a famous communicator of science to the general public. In his talk, "Getting Beyond a Blind Date with Science," (Columbia University, May 6, 2015), he explained that getting the public to appreciate science is like dating. There are three stages: attraction, infatuation, and then commitment. To get children to appreciate the importance of environmental science and the need for stewardship, first we need to attract them to the topic, next help them become infatuated with the concept of helping the planet, and then, with continued exposure, will come personal responsibility.

Acknowledgements

I'm grateful to NOAA's Climate Stewards program for the professional development they offer, as well as for the opportunities they afford teachers as we work together to get climate science into schools.

Resources

NASA Climate Kids: climatekids.nasa.gov/

NOAA Planet Stewards Education Project: oceanservice.noaa.gov/education/planet-stewards/

National Geographic: natgeokids.com/uk/discover/geography/general-geography/what-is-climate-change/

The Climate Reality Project: climaterealityproject.org/blog/just-kids-what-climate-change-and-what-can-i-do

Kids Against Climate Change: kidsagainstclimatechange.com/

Animoto video: animoto.com/play/jr1fazm1aPgrObEFuMXL1Q

Reference

NGSS Lead States. (2013). *Next Generation Science Standards: For states, by states*. Washington, DC: The National Academies Press.

About the Author

Kottie Christie-Blick is a teacher in the South Orangetown Central School District in New York State. She is also an educational consultant who specializes in teaching educators how to teach about climate change. She is the creator of the children's blog kidsagainstclimatechange.com. She is a NOAA Climate Stewards Educator and a Distinguished Fulbright Teacher. Kottie can be reached at kchristieblick@socsd.org.