Don’t Mess With Lubbock:

*Keep Lubbock Healthy!*

A Presentation by Nancy L. Hoffmann
Introduction

Litter is a serious problem that has damaging effects worldwide. This presentation will demonstrate that litter is a fairly recent concern in modern medicine, and will describe some of the various kinds (cigarette butts, plastic, metal, glass) that are injuring both humans and wildlife today. The United States, Texas and the City of Lubbock have all taken measures to address the problem, but there is still much to be done. We propose to isolate a population in the zip code of 74915, the neighborhood of Arnett Benson in Lubbock, and the Cavazos Middle School specifically, to study this problem — and test the hypothesis that, by making the students aware of the littering problem, and by educating the community around the school, the problem will eventually be solved in both the school and Arnett Benson. The project is tentatively named, “Keep Lubbock Healthy!” Working with Lubbock’s “Keep Lubbock Beautiful” agency, we will start by studying the school building and grounds, and then educate the student body and the neighborhood regarding the hazards of litter, in the hopes of eventually changing their habits. First, we will briefly define this target population and cover how littering affects them. Then, using the scientific method, we will help the students perform a series of experiments and analyses to see if this hypothesis is valid over a lengthy period of time. Finally, we will assess the strengths and weaknesses of the project, plus the barriers and facilitators to its implementation, and draw conclusions as to its feasibility.
When Did Litter Become a Problem?

Florence Nightingale (1820-1910), the founder of the nursing profession, emphasized the importance of removing “foul litter” from a sick room (The Times, 1876). In her day, proper hygiene was unknown and modern germ theory lay in the distant future. Yet she saw that litter was an impediment to the successful recovery of a patient. In fact, it was not until the surgeon, Joseph Lister (1827-1912), began cleaning wounds with carbolic acid, that antiseptic surgery was introduced in the late 1800s. Lister also was the first to encourage hand washing and the sterilization of surgical instruments to prevent infection.

Today, we find a different kind of litter in public places: discarded paper and plastic food containers, aluminum soda and beer cans and glass bottles, among other trash. The most prevalent and damaging item is the cigarette butt (Grieve, 2014), which contains toxic chemicals and takes many, many years to degrade — polluting the soil and water with its toxic elements. Wildlife is at risk, as fish ingest (and die of) the broken plastic and metal objects. Land animals are similarly at risk, as well.
Why Are Cigarette Butts a Problem?

Cigarettes create problems well beyond the damage they do to smokers’ bodies and to others, through second-hand smoke. The Ocean Conservancy sponsors an annual International Coastal Cleanup Day with over 500,000 volunteers picking up litter from beaches, rivers, lakes and streams worldwide: in 1998, 1,616,841 cigarette butts were collected on just that one day! (Ocean Conservancy, 2014).

According to Kathleen Register (adjunct faculty in the Department of Natural Sciences at Longwood College in Virginia), the filters alone from one pack of cigarettes (with 20 per pack) weigh .12 ounces. One smoker consumes 10,000 cigarettes per year, for a total of 3.75 pounds of butts per smoker: which comes to an annual global total of 2,103,000,000 [more than 2.1 BILLION] POUNDS of cigarette butts — based on 1998 global cigarette production. This weight does not include any tobacco or paper still attached to the filter, nor the packaging, matches, disposable lighters or other waste that generates litter and is associated with smoking (2000).

95% of cigarettes contain cellulose acetate, a plastic that degrades very slowly. Tobacco leaves contain the very toxic alkaloid, nicotine, which is a powerful insecticide and highly soluble in water. Another 4% of each cigarette is “additives,” including the anesthetic, menthol. The sticky yellow-brown “tar” residue is composed of several organic and inorganic chemicals, including several carcinogens. As Register points out, “Since tobacco is not classified as a food or drug, there are no legal maximums on agricultural chemicals or chemical additives cigarettes may contain.” If tossed butts clog drains around buildings, mosquito colonies can breed, causing other health problems. Drinking water, fisheries, wildlife and recreational areas can become polluted by cigarette litter. Due to smoking bans, cigarette butts now accumulate outside of buildings. The director of Keep Clean Australia says that cigarette butts account for 50% of all litter. (Register, 2000).
Why Is Trash a Problem?

Plastic bottles, bags, containers and other items, plus glass, metal and paper, create litter worldwide. Yet in spite of programs that raise awareness (such as Kick Butt Day and the International Coastal Cleanup), it remains a constant problem.

According to National Geographic, The Great Pacific Garbage Patch (or Pacific Vortex) lies between the islands of Hawai’i and the coast of California, and is about seven million square miles (or nineteen million square kilometers) in size. (There is also a similar “island” in the North Atlantic). To put this in perspective, the Pacific Vortex is more than twice the size of Texas — and growing fast!

Although debris can include anything from surgical syringes to bottles, the bulk of the Pacific Vortex is plastic, such as the water bottles Americans buy and dispose of so casually. This plastic blocks sunlight from penetrating the ocean’s surface and reaching the algae and plankton below, creating a shortage of food for animals and fish, such as tuna, sharks and whales.

Cleaning up this trash would be a multinational effort, and so far no country is willing to do it. Using nets to scoop up the trash would also capture many of the animals the rescuers intended to save; while no one knows exactly how much trash has sunk to the bottom of the ocean. To date, there seems to be no solution to this problem.

According to an article in the Examiner, discarded cans and cups can hold rainwater providing a breeding ground for mosquitoes that can transmit West Nile Virus or Malaria. About 18% of the litter traveling through local storm water systems ends up in local streams, rivers and waterways. According to the U.S. Bureau of Land Management, cleaning up litter in the U.S. costs hundreds of dollars per ton (about ten times more than the cost of trash disposal), for a cost totaling about $11 billion per year. Because trash takes time to biodegrade, the article cites these risks to the planet (2011):

- Paper: 6 months,
- Cigarette butts: 2–5 years,
- Plastic (PET) Soda Bottles: 5–10 years,
- Plastic grocery bags: 10–30 years,
- Foam cups or wrapping: 90 years,
- Tin Cans: 80–100 years,
- Aluminum Cans: 200–400 years.
What Have Texas, the USA and Lubbock Done About Litter?

In any neighborhood, litter creates health problems for humans. According to a 2012 study by Bennett, “respiratory complications, diseases from rodent infestation, injuries and depression were often cited as health impacts from litter and trash” (2012). In 1985, The Texas Highway Commission launched an anti-litter campaign whose famous slogan was “Don’t Mess With Texas” (2014). Today, almost every state (including Texas) has passed laws that impose hefty fines — and even imprisonment — for littering (Schultz, 2014).

Grieve quotes: “In Houston, Dallas, San Antonio and Austin, Texas, litter-law prosecutions are up sharply, according to John Ockels, the director of the Texas Illegal Dumping Resource Center, a nonprofit organization in Sherman, Texas, that fights litter. ‘Nobody running for office in Texas ever wants to be soft on crime,’ Ockels explained, ‘and nowadays that includes environmental law enforcement’” (2014).

The Ocean Conservancy conducts research to prevent trash from reaching the waters, working with scientists, the public, corporations and politicians. They also mobilize volunteers to clean up beaches worldwide, and prevent litter from injuring wildlife, in the International Coastal Cleanup: this year’s will take place on 20 September 2014 (Ocean Conservancy, 2014).

Meanwhile, the City of Lubbock created “Keep Lubbock Beautiful,” an agency that has organized separate campaigns to clean up litter and cigarette butts, as well as “Adopt-A-Spot” programs. A strong recycling program has further helped keep the city cleaner than ever. As of July 2012, there were two manned drop-off locations (with two more then in the works), plus five unmanned drop-off locations throughout the city. Penny Morin, interim collection manager for Lubbock’s solid waste residential division, is quoted by the Lubbock Avalanche-Journal as saying: “The city collected 1,223 tons — nearly 2.5 million pounds — of recyclables, not including yard debris like trimmed tree limbs, in 2011 alone.” Of course, getting people to put the right trash in the right bin is still a problem (Young, 2012).

And there is always much more to be accomplished.
Personal Interview with Raquel Padilla, Staff Liaison, Keep Lubbock Beautiful (City of Lubbock)

According to Ms. Padilla (interviewed on 4 August 2014), the most littered part of Lubbock is the Yellow House Canyon System, which provides the city’s water. When it rains, grass and various kinds of debris get carried into Playa Lake and the canyon lake system. This requires frequent cleaning to keep the water supply safe. She also describes the zip code 79401 as being very heavily littered, since it is the most crowded area of the city and close to downtown.

Ms. Padilla further stated that Keep Lubbock Beautiful currently has two schools that are applying to adopt a block (the city is finalizing the details on contracts with them). The schools will, over a two-year period, clean up their chosen block three or more times a year, as needed. Her program will supply everything the students need to collect the trash, and the city will pick up the filled trash bags when they are done.

Keep Lubbock Beautiful’s contract will be used in our project, as well, which will allow us to get our clean-up materials from the city. The Safety Guidelines of this contract include the following “Dos” and “Don’ts”:

- **DO** work as a group, in pairs during cleanup dates. Never venture out alone.
- **DO** walk facing traffic, being careful to stay away from the pavement’s edge.
- **DO** wear light or bright colored protective clothing, as well as hard-soled shoes. Sandals or open toe shoes should not be worn. Wear work gloves to protect against cuts, scrapes and contact with poisonous plants.
- **DO** make participants aware of the possibility of contact with poison plants, noxious weeds, bees, snakes, etc. Stay alert and avoid them and always carry insect repellent.
- **DO** work only during daylight hours and in good weather.
- **DO** provide adult supervision for group members less than 18 years of age.
- **DO** carpool to the pickup site to keep the number of cars to a minimum. Park all cars clear of roadway.
- **DON’T** horse around or do anything that will distract other volunteers.
- **DON’T** participate in litter cleanups activities while under the influence of alcohol or drugs.
- **DON’T** overexert yourself.
- **DON’T** pick up litter on construction sites.
- **DON’T** pick up hazardous materials.
- **DON’T** step into high-vegetated areas or stick your hands under objects or into high-vegetated areas.
- **DON’T** trespass.
Target Population: Facts about Cavazos Middle School and the Arnett Benson Neighborhood

- To begin with, there are 247 seventh-grade students in the school, which is located in the Arnett Benson neighborhood of Lubbock.

- Of the nine middle schools in the Lubbock Independent School District (LISD), it ranked seventh in 2014.

- Furthermore, Cavazos ranked worse than 96.3% of all Texan middle schools. In 2011, 32.1% of 79415 residents had incomes below the poverty line (compared with 20.8% in Lubbock and 18.5% for the state of Texas).

- 44% of the population in 79415 is from Mexico, while in Arnett Benson, the percentage is much higher.

- In Arnett Benson, 9.4% of people speak English badly or not at all, compared with 2.4% in all of Lubbock (Cavazos Middle, 2014).

- Arnett Benson surpasses Lubbock in Masters, Professional and Doctorate degrees, even though about 40% never finished high school.
**Target Population: Facts, Illustrated:**

**Left:** Zip Code 79415, with Arnett Benson Inset

**Right:** Arnett Benson Neighborhood
**Target Population: More Facts, Illustrated:**

**Arnett Benson**

[Chart showing racial distribution in Arnett Benson]

**Zip Code 74915**

[Chart showing racial distribution in Zip Code 74915]

**Educational Attainment (%):**

[Bar chart showing educational attainment in Arnett Benson and Lubbock]

**Note:** In the above chart, Arnett Benson surpasses Lubbock in Masters, Professional and Doctorate degrees, even though about 40% never finished high school.

The above map shows the location of 5 parks in zip code 74915; plus a yellow inset showing the Arnett Benson neighborhood.
How Does Litter Affect the Target Population?

The site, Green Eco Services (2008), offers ten harmful effects litter can have on humans, animals and the environment. To paraphrase the list, these ten effects include:

1. Litter in the streets and parks can travel through storm drains to bays and oceans, where it harms wildlife.

3. Litter costs money. Removing litter costs everyone who pays taxes.

5. Litter is a threat to public health: it attracts rats and other rodents, and is a breeding ground for mosquitoes and bacteria.

7. Litter can be a fire hazard.

9. Litter looks bad and can affect the value of your home and business.

11. Litter can affect the local economy, especially in tourist locations.

13. Litter breeds other litter and sends out the message that people don’t care. This will downgrade real estate values.

15. Litter harms and even kills wildlife.

17. Litter harms waterways. As even animal leavings, leaves and grass affect wildlife, think what plastic, glass, metal and cigarette butts can do!

10. Litter is demoralizing and disgusting. People who live in highly littered areas often suffer from respiratory diseases and depression.
The Scientific Method

**SCIENTIFIC METHOD**

**PURPOSE**
State the problem.

**RESEARCH**
Find out about the topic.

**HYPOTHESIS**
Predict the outcome to the problem.

**EXPERIMENT**
Develop a procedure to test the hypothesis.

**ANALYSIS**
Record the results of the experiment.

**CONCLUSION**
Compare the hypothesis to the experiment’s conclusion.
The Project: “Keep Lubbock Healthy!”

Relevance of the Project

Although much has been written about the need for clean soil, air and water, more needs to be accomplished at the grassroots level. As already mentioned, Lubbock has a strong recycling program in place, yet people still leave trash beside the bins or put it in the wrong bin. Parks, schools and the downtown area continue to suffer from a litter problem that threatens the fragile Yellow House Canyon System, which provides clean water for the city. Even knowing the health risks, people continue to smoke, oblivious to the damage done by the cigarette butts they leave behind them. Wildlife eat or become entangled in trash, and often die as a result.

The idea needs to be brought home to the community at an individual level: yes, one person — and one community — can make a difference.

Conceptual Framework of the Project

Our proposed project will be conducted with the seventh-graders — especially the biology classes — at Cavazos Middle School (zip code 79415). The three-part focus will be on:

1) cleaning up litter;
2) reducing the amount of future litter; and
3) educating the both the school — and the households neighborhood— on the dangers of litter.

The community health issues that would be addressed would include clean soil and water, and how these would affect the population of Lubbock in general, and that of Arnett Benson specifically. Soil percolation would be studied, including how toxic chemicals travel down through various kinds of soil and into the water table. The effects of trash on the Yellow House Canyon System and the Lubbock clean water supply would also be considered. The health issues of smoking would be addressed, as well as the toxic by-products left behind by cigarette butts in the environment. Finally, the impact of trash on fish and wildlife, both globally and locally, would be studied. This information would later be passed on to the entire student body of the school at the final all-school assembly, and to the community, when the surveys are conducted.

The study will be scientifically conducted by all of the students of the seventh grade of Cavazos — divided into teams of five to ten students — under the supervision of the school faculty. (Teachers can be assigned once the project has been approved by the school, but before the contract with Keep Lubbock Beautiful is signed).

The project (for now) is called “Keep Lubbock Healthy!”
The Project: “Keep Lubbock Healthy!” (continued)

Initiating the Project in the School

To get this project off the ground, it would be necessary to sell the concept of this project and its outcomes to both the principal of Cavazos and to Raquel Padilla, who would then be able to make a good case for its educational and social value to the teachers and parents. Raquel especially could address any safety concerns, and the principal could emphasize the benefits that would accrue to the school and the students alike.

Before the project begins, a meeting among the faculty members must be held to decide how to divide up the seventh grade into teams, and who would lead each team. Parental permission must also be obtained in advance. A schedule for each team’s time in the field and in the classroom needs to be created, as well. An Excel sheet or similar Score Card needs to be created (which would be copied for each team), detailing the different types of litter that the students will be counting. Finally, the school building and grounds have to be divided up into spots the teams will be studying.

Once the teams and their leaders have been defined, the lesson plans for the project need to be created, especially for the biology classes. The skills the students will have acquired by the end of the project will include:

- Math and Statistics (Percentages),
- English, both Spoken and Written
- Science, Biology, Environmental Studies and the Scientific Method
- Conducting Research (both in the library and online)
- Computer Skills
- Selling an Idea
- Conducting Surveys
- Public Speaking
- Being a Good Team Player

. . . Plus many more invaluable skills that will serve them well in high school, college, graduate school and the workplace: not to mention life, in general.
The Project: “Keep Lubbock Healthy!” (continued)

Applying for the Project with Keep Lubbock Beautiful

Once the steps below have been finalized, the school can apply for a contract from Keep Lubbock Beautiful. When the project is given the green light, the necessary materials (gloves, garbage bags, etc.) will be provided to the various teams by the City of Lubbock and the project can begin. Raquel Padilla is the contact for the city: (806) 775-3081; rpadilla@mylubbock.us.

Keep Lubbock Beautiful’s Contract: Litter Clean-up Guidelines

- Keep Lubbock Beautiful shall coordinate, review and approve the area(s) of clean-up.

- Any local community or social organization, youth group, or business (18 years or older) will be allowed to cleanup. Participants must have an approved agreement on file with our office prior to conducting any cleanup.

- Group members less than 18 years of age must be supervised by an adult 18 years or older. One adult per five under-age group members is required. Parental permission shall be obtained for each minor.

- The group contact is required to meet with their participants to review safety guidelines prior to each cleanup. No participant may be involved in a litter cleanup unless they have reviewed the safety guidelines.

- Keep Lubbock Beautiful will supply participants with safety information, trash bags, pick-up sticks, or other materials required for the cleanup.

- The Keep Lubbock Beautiful coordinator may issue that materials will be picked up prior to the cleanup or be on-site to facilitate cleanup equipment and assistance as deem necessary.

- Keep Lubbock Beautiful reserves the right to revise these conditions or discontinue the program at any time.

- The group’s members shall not trespass on private property.

- Each person participating in any cleanup activities related to the City’s Cleanup Program does so at his or her own risk, and the City of Lubbock, its employees, agents, and officials shall not be responsible or liable for property damage or personal injury resulting from such participation. The applicant shall so advise all participants of the foregoing conditions.
The Project: “Keep Lubbock Healthy!” (continued)

Need for the Project: Interview with Oscar Martinez

Oscar Martinez, janitor for Cavazos Middle School, noted in our August 4th interview with him that the students throw papers in the hallways and outside the school building. Lunch times and between classes are the busiest times for him to clean up the trash they leave behind.

He has also noticed a large amount of litter behind the school, even though there are trash containers located there. In fact, the students even throw trash on the ground beside the containers. The trash is a little of everything: papers, food containers, food, etc. Isolated areas around the school and the space under the school bleachers are the two dirtiest areas the janitor cited, with abundant cigarette butts, among other trash. Apparently smoking is not unheard-of in this target population.

As trash can attract wildlife, potentially hurting both the animals and the students who accidentally come into contact with them, it is important to make the students and their neighborhood aware of the importance of recycling all forms of litter. Bugs (such as mosquitoes, and worse) are also attracted to decaying food and liquid in dumped containers. Cigarette butts take a very long time to degrade and when they do, they put toxic chemicals into the soil and the water supply. In short, the health of the community, the soil and the watershed depend on a strongly enforced anti-littering policy.

Hypothesis

This project will test the hypothesis that, by making the students aware of the littering problem and by educating the community around the school, the problem will eventually be solved in both the school and Arnett Benson.

Experimental Methodology

First, the 7th-grade students will be divided into teams of five people, each team under the leadership of a faculty member. Each team will be assigned a spot around the school and its grounds that has previously had litter tossed onto it. Students will be issued score cards on which to mark the date they found the litter and the type of trash they found, including how many of each item was present.
The Project: “Keep Lubbock Healthy!” (continued)

Second, each team will go to their designated site, preferably during their biology class, and count and sort the number of trash items they find there. (Gloves will be provided by the city to promote safe hygiene while performing this task). All team members will take photos and video to add to their final presentations.

Third, the students will return to their classroom and total the items by number and type. They will also weigh each of their collections by type of item.

Steps One, Two and Three will be repeated within a designated time frame (perhaps once a month or once every two months?), to determine if the amount of litter each team found was an accident, or if these spots collected these amounts of litter on a regular basis. The seventh graders will then do research (in the library or online) as to what the dangers of each type of item are, and they will write a report detailing their findings.

Fourth, the teams will share their findings with their each other, and a designated Score Keeper will total the number of items, the various kinds of items, and the total weight of each type of item, for a given number of teams. Then the teachers (in an all-school meeting in the auditorium) will present the grand total number (and weight) of each kind of litter discovered and how many pounds of each type were collected by the teams. They will ask designated students (elected Team Leaders? Score Keepers?) to speak about each of the different findings and the unique hazards each type of litter to humans and wildlife health, plus why it is specifically important to the student body (and their families) to not litter.

Fifth, the teams will create survey questions and flyers (in English and Spanish) summarizing their findings. Among the questions should be one that asks how they can get litterers to change their habits. Are the efforts of the seventh graders enough? Or is more needed?

Sixth, the teams will break up into groups of two (one of whom must be fluent in Spanish), accompanied by a parent or teacher, to survey all of the households around the school and in the Arnett Benson neighborhood. They will leave behind the flyers at each house/apartment as a reinforcement to their message.
The Project: “Keep Lubbock Healthy!” (continued)

Seventh, they will analyze the results of their surveys to discover how the community perceives the health hazards that littering creates and if they plan to better respond to the litter laws in the future. Which groups are least interested in an anti-littering campaign? How do these break down by race, income, education, location, etc., in the neighborhood? How can they be better educated as to the hazards litter creates?

Eighth, each student will write a (± ten-page) report (or do a PowerPoint presentation) outlining the hypothesis, the methodology, the results, the survey and their analysis of the problem and its solution. Did their findings endorse the hypothesis or not? They will illustrate their paper (or PowerPoint) with the photos they took during their litter collection.

Finally, another round of Steps One through Three will be performed a few months later, to confirm or deny this hypothesis.

The following September, the former seventh grade will mentor the incoming seventh graders as they begin the project all over again. Will these educational efforts pay off? Stay tuned!

This project can continue until the litter problem in the Arnett Benson neighborhood (and at Cavazos Middle School) is solved.

Strengths of the Project

As Cavazos Middle School is not ranked as highly as other middle schools in Lubbock, this would be a great opportunity for these students to learn the Scientific Method, and to apply it to field research. Math, statistics (percentages), English, science, research, computer skills — plus conducting surveys, public speaking, being a good team player, etc. — would be among their achievements.

Additionally, they will be teaching the sixth and eighth graders about what they have learned at the final assembly and in the following year. At the end of the project, they will write up their results in a (±ten-page) research paper: great skills for any seventh grader to have! The process will build confidence, as well as skills that will last into graduate school and beyond: how can such positive outcomes even be measured?
The Project: “Keep Lubbock Healthy!” (continued)

Weaknesses of the Project

Cavazos Middle School, at this time, has only two biology teachers, so all of the faculty would have to be involved in this special project. If 247 students are to be divided into teams of five to ten students, that would mean forty-nine teams to be supervised by a total of 47 teachers (and maybe the principal): or each teacher could be responsible for two teams.

Then there’s the question of scheduling them for their “spot checks” and getting them back into the classroom to process their findings. All of which may make the faculty a bit unhappy.

However, it’s been done before, although it the focus was on parks and other places, so Raquel Padilla (Staff Liaison, Keep Lubbock Beautiful, City of Lubbock) could be a great help in organizing these efforts.

Finally, there is the question of the importance of teaching about litter, not to mention the necessary math, statistics (percentages), English, science, research and computer skills — plus conducting surveys, public speaking, being a good team player, etc.

However, the outcome for the students, while intangible, would be long-lasting — and priceless.

Barriers to Implementation of the Project

The primary resistance to anything new in the curriculum would first come from the faculty, who might perceive it to be something that would create more work for them. The families might also express concern, if they did not really understand the goals of the project.

Therefore, it would be necessary to sell the concept of this project and its outcomes to both the principal of Cavazos, and to Raquel Padilla, who would then be able to make a good case for its educational and social value to the teachers and parents. Raquel especially could address any safety concerns, and the principal could emphasize the benefits that would accrue to the school and the students alike.
The Project: “Keep Lubbock Healthy!” (continued)

Facilitators to Implementation of the Project

The City of Lubbock — and particularly, Raquel Padilla, Staff Liaison for Keep Lubbock Beautiful — are huge assets that would definitely help in getting this project off the ground. They have examples of previous and current school projects that are similar enough to alleviate any worries that teachers and parents might express. Furthermore, the success of this (ongoing) project might even boost the educational rating of Cavazos Middle School, which is sorely in need of such help.

In short, the project is a win-win situation for students, school and community alike.
Conclusion

There is ample research to back the assertion that littering is causing global health problems, both for humans and for wildlife. This presentation has aimed to set this assertion in a historical framework and to discuss the nature of some of the damage littering has created, as well as a few of the solutions that have gone into effect in the state and the country. We then proposed a project (Keep Lubbock Healthy!) to be conducted as a study of littering in the Arnett Benson neighborhood of Lubbock, TX, with the experiments and analyses to be carried out by seventh graders at the Cavazos Middle School, over a long duration. Working with the city’s Keep Lubbock Beautiful agency, we would adhere to their strict safety guidelines in the matter of small teams collecting, counting the types and weighing the trash in various spots around the school’s building and grounds. After several such collections, the students would create both written and oral reports on their findings, and conduct a survey of local residents, in the hopes of educating them and eventually changing their littering habits. Both the litter collections and the surveys will have measureable results, and over time, we hope these results will improve. We feel that this project would have a beneficial effect on the students, the parents and the school in general, as new, useful skills are learned, and a community to unites behind the problem — and solution — of litter.
References


References (continued)


