



# ZERO WASTE REVOLUTION

2015-2016 School Year

## MONTHLY REPORT • NOVEMBER

### We're going to the STATE CHAMPIONSHIP!

On November 7th, Lanikai School fielded two teams at the **FIRST LEGO® League** Regional Robotics Competition held at Maunawili Elementary. The theme this year was *Trash Trek*.



We figured that we had an advantage on this particular subject because we walk the talk of waste management at Lanikai School – it's much more than an academic exercise – but the true foundation of this effort is the superb afterschool robotics program under the direction of Mr. Parker Sawyer assisted by his dad, Mr. John Sawyer, and 6th grade parents. Robotics has attracted smart, hard-working students for nine years.

At the end of a tough day of competition, Lanikai's team the **Pizzabots** were victorious. They accrued enough points in the three areas of robot performance, project, and interview to beat out even the powerhouse teams from Punahou and Iolani!

A few days later we found out that Team **Triple L**, who had been won an Alternate position in last month's Regionals had been upgraded – so we have not one but *two* teams going to the State Championship.

Sixty Regional winners from all over Hawaii will compete at Blaisdell Expo Hall on December 5th. We are so proud of all our robotics participants.



Regional Robotics Champions Teams Pizzabot and Triple L

## Planting trees for Carbon Neutrality



Participants gathered at Hamakua Marsh to get instructions from **Dr. Camilo Mora**, who envisioned and designed the Carbon Neutrality Project. Described as “integrating communities in a movement to solve climate change,” this innovative program pairs a strategy to reduce carbon emissions with restoration of native ecosystems.

Fourth graders participate in the **Carbon Neutrality Project**, where in three intensive 90-minute classroom sessions they have studied how the increase in carbon emissions that defines modern life has steadily degraded the environment and leads to potentially catastrophic climate change.

One of the features of this program is an interactive website (still under development) that calculates how much CO<sub>2</sub> is produced by individual students or groups and figures how many trees must be planted to sequester that carbon.



Then, along with their parents and working in conjunction with DLNR or local conservation organizations, they go out to *actually plant those trees*. A special “smart watering system” keeps young plants and seedlings properly hydrated for weeks at a time. The research is underway to develop sensors for these systems that will allow participants to check on their plant’s condition on a mobile phone! Impressively, this project deploys both “techno fix” as well as good ol’ fashion behavioral change to achieve a clear objective.

On **November 14th**, twenty 4th grade student volunteers and their parents convened on a gorgeous day at Hamakua Marsh to plant 30 native species including *Milo*, *Ulei*, *Loulu* and *Ahu’awa*. (One is a regular tree, one is a palm, one is a sedge used by waterfowl to build nests, and one is a large bush.) The event was organized by 4th grade teacher Mrs. Judy Pao in coordination with Dr. Lisa Marten, one of the founders of the Carbon Neutrality Project.

Mr. Sawyer and the Green Team also helped out that day with six 6th graders in attendance. They brought with them a box of our freshly harvested compost to put near the roots. Everyone got at least a few handfuls and they only wished they had brought more.

## **Carbon Neutrality at Lanikai**

While planting and caring for native trees at a special place is an inspiring and exciting activity to reduce atmospheric carbon, there are many other ways to attain carbon neutrality.

*Here's how technology, wise choices, and daily Zero Waste practices on the Lanikai School campus reduce our carbon footprint every day:*

### **Photovoltaics cut back on coal-power use**

The school's solar panel array was installed in 2010. It produces 50% of the electricity we use so we are less dependent on the coal-burning power plant. Innovative fixtures such as Solar Tubes in the office magnify natural light to brighten rooms without using electricity at all.

### **Locally-sourced lunch eliminates shipping and supports organic agriculture**

Our esteemed caterer, One Love Cafe, uses only local produce, meat, fish, and fowl, grown organically without petro-based chemical fertilizers and pesticides. Public schools stuck with DOE food service serve 99% processed and industrially-produced foods shipped here all the way from the mainland.

### **We plant and maintain lush, productive year 'round gardens**

The AINA program has taught us to grow amazing gardens yielding both vegetable crops and flowers. Even over the summer our beds are planted with cover crops that not only fix nitrogen in the soil but absorb carbon out of the air.

### **On-site waste processing cuts down on carbon-heavy transportation**

Because we compost tons of food, paper, and cardboard on site, we reduce the number of dumpster loads that enter the wastestream requiring fossil fuel transportation and processing in energy-intensive centralized facilities

### **Composting produces rich, living soil**

The compost we create teems with microbial life that acts as a carbon storehouse.

### **Sheet mulching increases organism populations and biodiversity**

Every square foot of schoolyard covered with mulch instead of dry, dead dirt supports vast populations of carbon-based life forms who retain and cycle carbon.

### **Smash the Trash**

Sort-It-Out Sam and *How Low Can We Go?* rubbish reduction initiatives in the cafeteria have reduced by thousands the number of petroleum-based plastic trash liners we annually contribute to incineration.

### **Biochar sequesters carbon in soil for thousands of years.**

Biochar is a highly stable carbon soil amendment originally used by pre-Columbian Amazonian farmers. We make biochar in present-day Kailua from discarded wood pallets and use it to increase soil fertility.

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When the Carbon Neutrality Project website goes live, it will be fascinating to calculate the carbon footprint of Lanikai School. As data-driven Ms. Mindy always says, "If you don't measure it, you can't manage it." We see how measurement motivates us to set goals for Zero Waste. Can we also count down our way to Zero Carbon Emissions?

## Biochar Project, Part 2

### Weather delays didn't dampen spirits

The rainy days that drenched Oahu this season may have postponed progress on the Biochar Project, but didn't drown out any enthusiasm.

Last month during a break in the wet weather we were able to fire up our Tinman retort to produce two solid batches of charcoal. It was crushed, screened, and nails were magnetically extracted. This processing provided enough material to kick off the biochar trials.



The **California Foundation for Agriculture in the Classroom**, the mainland organization who funded the Biochar Project, requested a mid-November progress report. We were able to e-mail a number of action shots to illustrate the blow-by-blow documentation that included burning! smashing! screening! extracting! They responded the next day to say they loved our report and were very impressed with such an exciting project.

### Now on to Part 2

The three special experimental biochar beds had been filled earlier with mulch as a base that would provide adequate drainage. The mulch will eventually break down.



*Mahalo to the 4th graders who do a great job harvesting our hot compost as their grade-level Zero Hero Service activity.*

On top of the mulch layer, soil harvested from the Yellow and Turquoise compost piles was added 6-8 inches deep. It took a lot of compost to fill three big planters.



### Add biochar and plant

Planting took place on **Wednesday, Nov. 25th**. One bed serves as control, with no biochar added. Five percent by volume of biochar was added and mixed into the second bed, and 10% to the third. The photo on the right shows Kaimi adding the measured volume of char. It was a windy day and a considerable amount charcoal dust swirled around.

At this point Mr. Sawyer decided to take over, since wind had not been taken into account and goggles and face masks were not on hand.

Students were sent upwind to plant the no-biochar bed while Mr. Sawyer continued adding char and mixed it thoroughly with the



organic-rich soil. Since Mr. Sawyer was the sole photographer that day there is no photo to document this step – sorry. He thought, “Hmmm... there’s got to be a better way to do this – maybe wet down the char prior to adding it...” Next time, this step of the protocol will likely be revised.

In each bed was planted two eggplants, one cherry tomato, one bell pepper, one Japanese cucumber, dill, cillantro, and basil seedlings. Sugar snap peas, carrots, and radishes were planted by seed.

The question is, “Does biochar thoroughly mixed into the root zone improve the growth of a variety of plants?”

Observations will be made daily. Measurements and pH will be taken weekly. Fruits and vegetables will be harvested periodically and weighed. Soil fertility will be analyzed using pH and nutrient levels.

## Chipping away at lunch waste

### Make washables permanent

The change from disposable food service items to reusable washables has made a tremendous impact in reducing our cafeteria waste load. All credit goes to Shannon of One Love Cafe for taking the initiative to invest in these items, haul them daily to and fro, and wash them at her off-site commercial kitchen.

For several days early in the month, Shannon lost her dishwasher helper and we went back to disposables temporarily. We had become so accustomed to our lovely washables that it was shocking to see so much junk waste again.

To stabilize the situation, a proposal was submitted to the LSO Board to purchase a commercial dishwasher for the use of One Love Cafe. The high cost of this item requires a vote of the LSO membership, which has been scheduled for December 10th.

We are hopeful that the membership will agree that this expenditure is warranted and necessary to keep us on track.

### Big rubbish cans retired– no need for them

In the meantime, it seems ridiculous to maintain the two big 32-gallon rubbish cans – and their toxic plastic liners – so we switched to two little 7-gallon rubbish cans that we line with corn-polymer biodegradable bags. (We were down to one by late last month.) Our friend Ed Souza, Jr. from Pacific Industrial Products made us two custom stands from remnant irrigation pipe.

At this point, we can see the big “0” at the end of the Zero Waste tunnel. The only items in our lunch trash now are cardboard boats and milk cartons along with packaging from home lunches including various kinds of non-biodegradable pieces made of mylar and plastic.

The question is *How Low Can We Go?*



*Special rubbish receptacles trim down the trash.*



*This is our total lunch rubbish for one day!*

## What's left and what can we do about it?

The school controls the bulk of the lunch waste. Lunch service items include cardboard boats, milk cartons, and disposable adult lunch trays. It's only a matter of money and time – and a dishwasher – when the boats and trays will be replaced with washables.

### Let's lose the milk cartons

Serious consideration should be given to replacing individual half-pint milk cartons with a refrigerated milk dispenser and reusable cups. There is much evidence posted online from schools who have made the switch to dispensers who not only realized cost savings but found that kids drank more milk because it tasted better. (Lanikai students dump out an average of two gallons a day).



### One day a week Waste Free!

Our visitors from Australia last month told us about Waste-Free Wednesdays. *Nine hundred* students and their parents are challenged to pack a lunch that generates no rubbish whatsoever.

At Lanikai School, the small amount of home-sourced rubbish generated on a typical day is very manageable – see inventory and photos – *we can do this!*



## LUNCH WASTE INVENTORY

### Typical day - 319 students

86 students and 4 teachers purchased school lunch (can go up to 110)

233 students brought lunch from home

### Food Service Items

- Cardboard boats: 90
- Milk cartons: 45
- Adult lunch trays: 4

### Home Lunch Items

- Mylar wrappers, juice pouches, etc.: 68
- Zip-lock bags: 30
- Rigid plastic: 21
- Soft plastic: 21
- Cardboard, paper bags, paper napkins: 16
- Aluminum foil: 6

The Trash Trek project stimulated much discussion about strategies to reduce packaging. These ideas will be developed over the next several weeks with the goal of rolling them out after the first of the year. Can we get to ZERO by March?

## Fallout from Compost College

Last month's über tour, **Compost College**, packed a considerable punch. In the days and weeks following this highly successful event, we were inundated with inquiries about scheduling private tours as well as requests for even more elaborate Compost College sessions, including for example, adding "student and family engagement activities" and developing an intensive training series.

Although we were flattered by the enthusiastic response, it did raise a conflict.

At the beginning of the school year, we stated as one of our two major goals, "to appropriately integrate everyone within our sphere of influence – staff, students, parents and the larger community – into the Zero Waste philosophy and daily practices through further development of waste-based curriculum and outreach" (August Monthly Report).

Clearly, "outreach" had gotten out of hand. It seemed we were spending more of our precious school day touring people around than attending to our own projects and working with our own students. Compost College took many hours of planning, preparation, execution, clean-up and recovery. While we certainly want to spread the word about our program, there is only so much time and energy to expend on other schools. Burned out for sure, we turned down all requests for future visits in order to regain our perspective and restore some balance.



*LeJardin Lower School Principal **Majken Johansson** and Middle School administrative assistant and parent **Nicole Lunn**.*

### **LeJardin the exception**

The only tour in November was one scheduled well in advance with a top-level administrative contingent from LeJardin Academy, initiated by Green Committee chair, **Michelle Garcia**. This group possessed all the essential elements that in our eyes made them good candidates for implementing a successful Zero Waste program, and were well worth our time.

First, they agreed with our recommendation to first perform a full waste audit to determine a baseline, a critical step that makes it possible to make informed decisions. Second, they realized that this program was not going to be run by teachers, custodians, or parent volunteers, but would require funding a staff position. Thirdly, they saw that an investment in durable, appropriately-scaled equipment was paramount.

In other words, they recognized the value of a proven professional program and are in a position to move forward realistically. They will be presenting a proposal based on their visit to their Board. We will stay in touch!



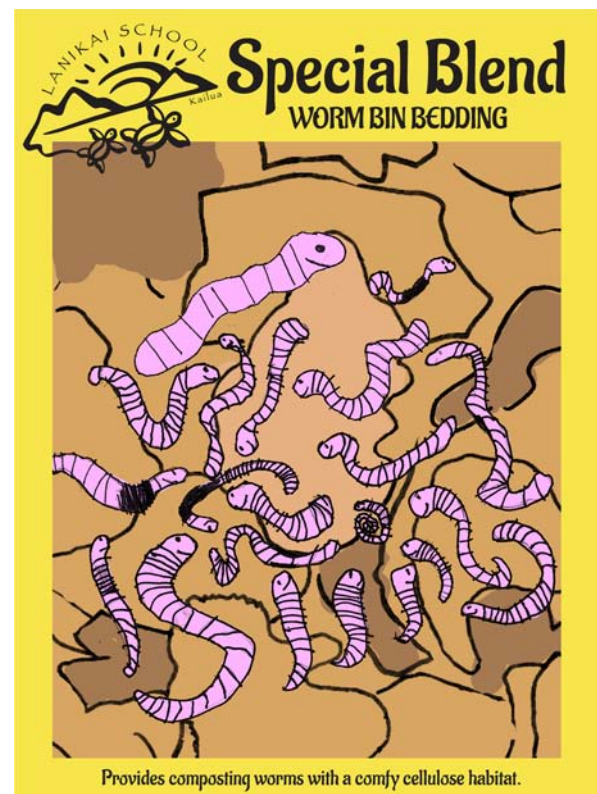
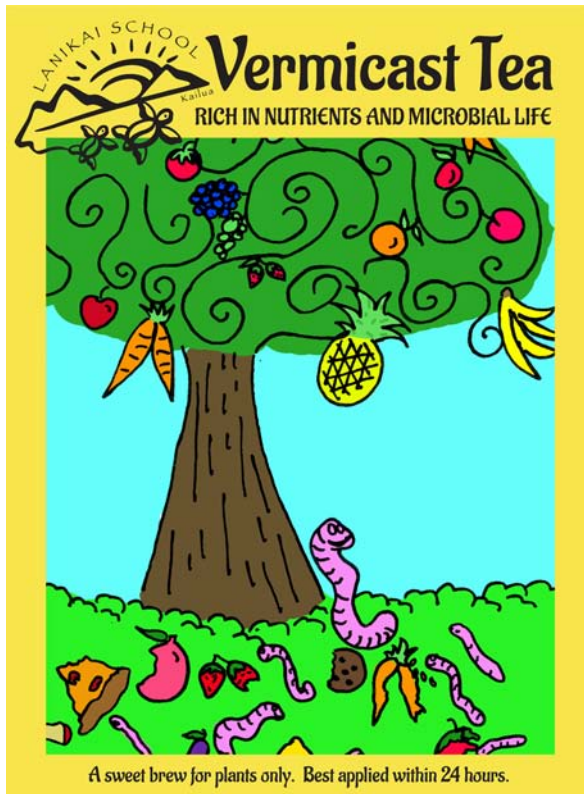
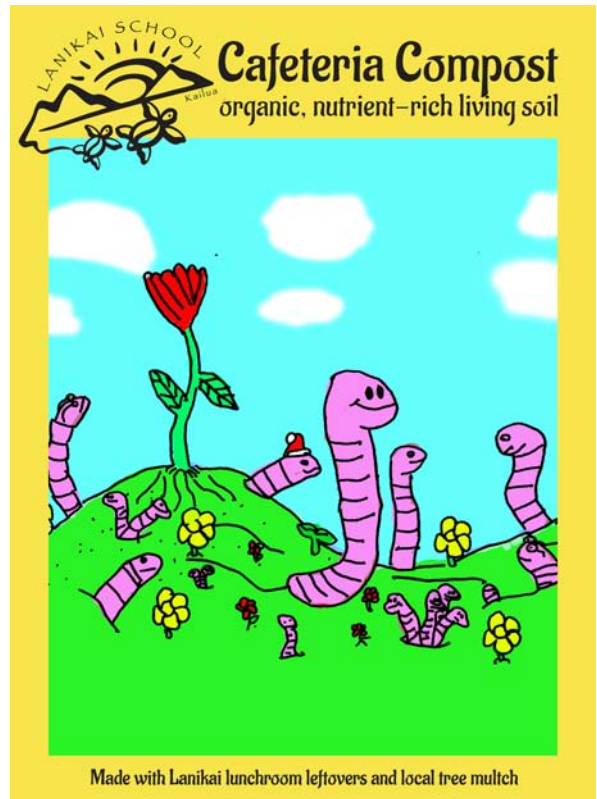
## Product labels

Ms. Kristi Petosa-Sigel's Lei Kukui art class researched product marketing and created colorful and charming Lanikai School brand labels for the various recovered products we currently sell including Worm Bin Bedding, Cafeteria Compost, and Vermicast Tea.

Each student came up with an original design and produced it in on their computers in Photoshop. Students voted to choose the best design for the final label.

It's wonderful to have such beautiful artwork to represent our project to the community. It is also gratifying that students can participate in the Zero Waste Revolution in so many ways, using their skills and creativity to express their own understanding and experience.

Many thanks to Ms. Kristi and her students for bringing this lovely idea to life!



## Bottom line for November 2015

This report covers the interval between November 1-30, 2015. School was closed for Veterans' Day and Thanksgiving. There were 18 classroom/lunch days during this period.

- Total food waste diversion rate was 100%. Total composted was **1,384 pounds** via vermicomposting, hot composting, and bokashi fermentation. Total composted since the beginning of the school year is **5,778 pounds**.
- 100% of all HI-5 cans and bottles were collected and redeemed.
- Approximately 90% of all paper and cardboard was collected and processed.
- *Zero* green waste was collected and processed. All was lost and landfilled.

## Coming up in December

- Meet our videographer! Mr. Noh has selected a moviemaker with a keen and sensitive eye to tell the story of Lanikai's Zero Waste Revolution.
- We'll do the numbers. Data from the first half of the school year includes weekly recovery log, hot compost history, and full analysis.
- Plan for going waste-free one day a week will be proposed.
- We are still eager to host a visit from our benefactor, Marilyn Katzman! We have accomplished a lot since August.



*Mr. Sawyer's reach is eight feet, four inches. Sunflowers measure 10.5 feet tall and are **still growing!** This bed was heavily amended with our own cafeteria compost and vermicast.*