



# ZERO WASTE REVOLUTION

2015-2016 School Year

## MONTHLY REPORT • OCTOBER

### Compost College • October 17, 2015

Lanikai School, in partnership with the AINA in Schools program of the Kokua Hawaii Foundation, (KHF) hosted the first ever **Compost College** on Saturday the 17th. This three-hour workshop was of Professional Development level, enabling DOE teachers to earn required credits. In attendance were 47 teachers representing 28 schools and other organizations, President and Founder of Kokua Hawaii Foundation Kim Johnson, four additional KHF staff members, a FoodCorps Hawaii service member, and Melissa Mano, Department of Education CTE (Career and Technical Education) Coordinator for the Windward District.

Our objective was to showcase the significant impact powerful Zero Waste practices have had in transforming both the physical campus and the culture of Lanikai School. To make the presentation more meaningful and memorable, hands-on activities were offered at nearly all stations in the tour. Many attendees jumped right in and got their hands dirty and their feet wet.

We hoped to impress but more importantly to inspire. This was our chance to shine with a assemblage of smart, capable people who can take action and make a difference on their own campuses.

All of the hard work we have invested over the last year was on glorious display. Incremental natural processes that occur over a long period of time are often hard to imagine. On our tour, participants could see all stages of each process – worms being fed and the finished vermicast; layering food waste with mulch in an active hot compost pile and actually harvesting cool, dark finished compost. Compost College attendees could see, touch, sniff, ask on the spot about the science, and ponder the magic and mystery.

Although the skies were threatening all morning, it did not rain.



*Harvesting finished compost.*

In the plenary session in the cafeteria, Mr. Sawyer and Ms. Espie presented a photo montage showing the dead, dry, dreary schoolyard explode with new life as the first AINA garden beds took shape only three years ago. Gardening awakened a curiosity and appreciation of the earth that quickly became a source of reward and satisfaction for students, teachers, and parents alike.

From there it became apparent that good soil would be essential to growing good gardens, and that composting was going to be the way to make that happen. Enter the Zero Waste Revolution with the systems and science to close the circle.



*By the expression on their faces, you would think that none of these teachers had ever seen a big handful of worms before. In fact, most had not.*

There were two tour loops each repeated twice covering sorting and collection, weighing and logging data, vermicomposting, hot composting, cellulose recycling, bokashi fermentation, biochar, and compost/vermicast tea. For details of each tour stop, see the ***TOUR GUIDE: Welcome to Lanikai School's Compost College*** insert at the end of this section.

We worked hard to make Compost College content-intensive, specific, relevant, active, and fun. The perfect morning was concluded with a delicious lunch from One Love Cafe.



*Worms consume about 17% of our food waste, mainly kitchen prep. Although this is not a lot of food, worm colonies also process the soft cardboard and mountains of paper waste generated by Lanikai School.*



*Teachers loved the look of the Mulberry Gang Pipeline PODs. Unfortunately, due to rising costs of materials, these cool bins are no longer available.*



**Teachers try hot composting from start to finish...**

*1. We set up a big pile of mulch and 188 pounds of food waste for two hot compost demos.*

*2. Teachers dug in and spread food, shoveled mulch layers, and...*

*3.... poked chimneys in the new pile.*

*4. A walk along our compost array is like going back in time. The Yellow pile was completed in May, and was harvested October 17th by Compost College participants.*

*5. Two shovelers dig out the finished compost and drop it on to a four-station screener where it is...*

*6. ...rubbed over the screen. The compost drops into the boxes below; the unfinished chunks are brushed off the side. The ventilated gray tubs filled with compost are easily moved for use or storage. Yellow yielded 19 full 10-gallon tubs.*





*Lunchroom Separation Stations are simple in theory and difficult in practice, because they must be set up, monitored, broken down, cleaned up and put away... by someone. The question is “who?”*



*Bokashi still elicits skepticism – it is very Japanese and unfamiliar to most westerners. Thirty-three pounds of fresh food waste was added to a batch started several weeks ago. Each Bokashi Blaster processes about 160 pounds via microbial fermentation. It is somewhat icky to deal with, but once buried in the soil, bokashi offers superb plant nutrition.*



*Mr. Sawyer’s pet project is the Lanikai Signature Soil mixes, blended from our own compost, vermicast, and biochar, and stored for use in empty Pipeline PODs.*



*Although because of wet weather we did not have a completed biochar burn to show everyone, Mr. Sawyer wowed the crowd with a stirring, dramatic presentation.*



*Ten gallons of freshly brewed vermicast tea was decanted from our brewer and bottled on the spot into recycled milk and shoyu bottles labeled with the Lanikai School brand name and design.*

*The tea was offered to Compost College participants for \$5/gallon. We sold out!*

# TOUR GUIDE

## Welcome to Lanikai School's Compost College

Saturday, October 17, 2015

At Lanikai School we regard waste as a valuable resource that can be processed on site to benefit both school and community. This is the 2nd year of a comprehensive, fully integrated resource recovery operation whose goal is to transform Lanikai into a Zero Waste campus. The Lanikai Zero Waste Revolution is a program of Oahu Resource Conservation and Development Council, funded by a generous gift from Steve and Marilyn Katzman. Waikiki Worm Company provides project management.

Following a brief introduction in the cafeteria, you will be divided into two groups to tour our operation. Hands-on experiences will be offered at some stops for those who wish to participate.

### GROUP A

Mindy Jaffe, Lanikai School Resource Recovery Specialist  
<mindy@waikikiworm.net>  
www.waikikiworm.com

### Tour Stop #A1 - Big Blue, installed July 2014

#### VERMICOMPOSTING

Activity: Feed the worms

Big Blue is a ten-foot lateral-flow Pipeline vermicomposting system with a six-month harvesting cycle. Worms are fed on the active side of a perforated divider (indicated by a beige bin blanket) for six months. After six months, finished vermicast is removed from the finishing side (green bin blanket) and replaced with fresh bedding of wood shavings and shredded cardboard. The bin blankets are switched. Food is added to the new active (beige) side only. The worms will migrate through the pukas in the divider to get to the food. The finishing side is watered for three months, then allowed to dry out for three months prior to harvesting.

Our Big Blue colony is typically fed 30-50 pounds of fruit, veggie, and grain waste weekly, alternating front half to back half. Food is covered with a thick layer of shredded paper. The worms are watered daily by the 2nd graders. This bin yields an average of 150 pounds of vermicast every six months.

### GLOSSARY

*Please use the correct terminology when you talk about worms.*

**Vermicomposting** - the controlled process of breaking down decaying organic matter using worms.

**Vermicomposting System or Worm Bin** - a worm-based mesophilic composting operation managed to promote the efficient breakdown of decaying organic matter.

**Vermiculture** - the cultivation of worms managed to promote worm reproduction.

**Worm Farm** - a worm breeding operation.

**Vermicast, vermicompost, worm castings** - worm poop

*Note: There is no such word as **vermicasting** – that means “worm pooping!” Also, please don't call your worm bin a worm farm unless it is!*

## **Tour Stop #A2 - The Mulberry Gang, installed January 2015**

### **VERMICOMPOSTING**

- Expansion of vermicomposting operation based on information gained from a food waste audit
- Each of five 5-foot lateral-flow Pipeline bins is fed 15-25 pounds of food weekly and yields an average of 70 pounds of vermicast every six months.
- Mulberry tree has thrived. Red-rumped Bulbuls eat the fruit and poop on the bins but keep Black Soldier Fly population in check.

## **Tour Stop #A3 - Resource Recovery Room**

### **VERMICOMPOSTING, SHEET MULCHING**

- All cardboard and office/school paper is collected and consolidated for processing at this cellulose recycling center. We have three heavy-duty shredders (teacher operated) to shred paper to make worm bed covering. All soft cardboard is soaked, drained, and torn by hand into small pieces by kindergartners and 1st graders to make worm bin bedding. Surplus bedding is sold to other schools at \$5 for five pounds.
- All hard or laminated cardboard boxes are used for sheet mulching, which mitigates flooding and erosion, keeps down weeds, and builds good soil.

## **Tour Stop #A4 - Hot Compost Record**

### **HOT COMPOSTING**

Our compost piles are color-coded for beauty and convenience. Every time new food is added, the temperature of the pile is noted and the food is weighed and logged in. When we reach 600 pounds (arbitrary - 500 pounds is minimum), we stop adding food to that pile and count six months from that date as the harvest day. The Hot Compost Record chart helps us to systematically manage our hot compost piles for optimal results and desired timing.

## **Tour Stop #A5: Compost piles, started March 2014**

### **HOT COMPOSTING**

Activity: Add food layer to active pile; harvest and screen finished compost

Our hot - a.k.a. thermal - compost piles are *aerated static piles*. That is, they are poked with pitchforks and puka'ed with chimneys to get air into the pile, but they are not turned. This is the best method when the feedstock includes meat and dairy products, as happens here since most food waste used is plate scrapings – post-consumer waste. This method takes the least labor but the most time. We are not in a rush.

Hot composting requires a large supply of wood mulch, which may be a limiting factor on some campuses.

Contact tree trimmers to request a free truckload.

### **GLOSSARY**

**Composting** - Controlled decomposition, the natural breakdown process of organic residue.

#### **Hot or Thermal Composting -**

A popular composting method using alternate layers of nitrogen feedstock (food/manure) and carbon (wood mulch) to create an environment favorable to *thermophilic* (“heat-loving”) bacteria whose metabolic activities create temperatures of 140°-165° that are sustained for several weeks.

**Food waste** is *food waste* – do not call it compost! To be compost, the material must go through the gut of critters.

### **Building the pile**

At the bottom of the pile is a layer of branches to provide aeration and drainage deep within the bed. On top of that, a thick layer of mulch is added, moistened and shaped to look like a huge thick pancake – flat on top.

To this base food waste is added and spread evenly over the surface, with big chunks or whole apples broken up. Cover a few inches of food with three times as much mulch, and make sure the food is covered completely - *no exposed food*. Continue to layer food and mulch like a lasagna, moistening generously and shaping as you go. Every few layers, finished soil, EM, or IMO may be added as inoculate. (We almost always forget to do this. Our mulch is semi-broken down and seems to be adequately populated with organisms.)

When all the food is used, shape and flatten the top and poke five chimneys in the top for aeration and venting of heat. Always finish with a thick layer of mulch. Cover with burlap bags or a tarp.

The minimum volume of material to reach high temperatures within the pile is one cubic yard. The heat will kill pathogens, weed seeds, and phytotoxins. This is called the active or *thermophilic* stage and should last for at least several weeks.

### **Maintenance of finished piles**

Be sure to thoroughly perforate and drench the pile (“poke and soak”) at least once a week until the composting process is complete. Re-poke chimneys when ever the pile is serviced. During this period, the pile will cool to around 110° and the mesophilic bacteria and multitudes of other organisms will take over. The bugger your pile, the better. Most invertebrates will move on during the curing stage, when the material finishes and stabilizes.

### **Harvesting the finished pile**

We count six months from the last feeding to determine harvest date. If harvesting earlier, let the material cure in ventilated containers for a while (curing times vary considerably due to conditions.)

Our two classrooms of 4th graders are in charge of harvesting our hot compost piles as their grade-level Zero Hero Service. A team of six students – four to screen and two to shovel, are scheduled for 25 minutes. They will take their places at the screening apparatus and process half the pile – and typically fill eight 10-gallon boxes. The second team will complete the pile. So we can harvest an entire compost pile – about 1-1/4 cubic yards – in under an hour! The finished compost is stored in ventilated Sterilite totes tucked under the trailer away from the rain and sun. Shelf life is 1-2 years.

Once a pile has been harvested, we add fresh mulch to the underlying “pad” and when ready start a new pile in the old location. By rotating piles in the same space over time, we are able to compost tons of food waste in a relatively small footprint.

FYI, last year’s hot compost operation, begun on March 1 and ended June 6, 2015, processed 2,552 pounds of food waste.

## **GROUP B**

Parker Sawyer, Lanikai School 6th grade/STEM teacher; AINA Garden Club Advisor  
<psawyer@lanikaielementary.com>

### **Tour Stop #B1 - Waste sorting and collecting**

**“IF YOU DON’T MEASURE IT, YOU CAN’T MANAGE IT!”**

#### **Food waste audit**

We highly recommend conducting a *food waste audit* so that you can make informed decisions regarding your recycling expansion plans. How much prep waste does the kitchen generate? What portion of your total waste is fruits, veggies, and grains? What portion is post-consumer waste with meat and dairy included? How much surplus waste is generated daily?

What are your plans for the material you plan to process on campus? Separate categories of food on a random sample day and weigh everything. If you wish, you can set a goal for improvement and register with the EPA’s Food Waste Reduction Challenge so that you are eligible for national recognition. <http://www2.epa.gov/sustainable-management-food/food-recovery-challenge-frc>.

#### **Lunchroom separation**

We have set up as an example the classic Separation Station that accommodates a fast-moving double line. Because our numbers are small, we use a modified version of this which you will see at lunch. You need tables, milk and food buckets, rubbish cans, a hanging scale, and a monitor to guide students through and assist as needed. A cheerful “thank you!” goes a long way here. At the end of collection, the material is consolidated, weighed, and logged. Two 6th graders work as lunch monitors for one week to fulfill their Zero Hero Service requirement.

#### **Satellite collection with Sort-It-Out Sam**

We determined that 15% of our daily waste – an average of ten pounds a day – was snack food, generated and disposed off all over the campus. To recover this resource (1,800 pounds a year), we acquired a charming recycling apparatus named Sort-It-Out Sam who takes snack waste, HI-5 cans and bottles, and school paper daily for collection. Twelve Sams replaced eleven 32-gallon rubbish cans in the classroom buildings, playground, and cafeteria. At 2pm daily, a designated Sort-It-Out Samurai from each class brings the items down to a central collection station. Sam’s belly bag – made out of biodegradable corn polymers – is changed only once a month. In A- Building, we went from using 2,000 plastic can liners per year to using only 100 biodegradable ones.

Separation and collection is by far the toughest part of Zero Waste, since it involves changing ingrained habits. Our kids are pretty good at it, but their exemplary recycling behavior is generally not reinforced at home or anywhere else in the community, so we have to constantly remind and cajole them. We always face a challenge around special events, classroom parties, and rain days. Collection is the most critical piece of our operation, however, so we work hard at it.

## **Tour Stop #B2 - Making bokashi**

### **BOKASHI COMPOSTING**

#### **Activity: Add food waste to Bokashi Blaster**

Bokashi fermentation is an excellent alternative at schools where compost piles and worm bins do not fit the schoolyard nor the budget.

#### **Bokashi is speedy**

Bokashi uses a consortium of yeasts and bacteria that function in an anaerobic environment to ferment or pickle organic material. Pickling changes the chemistry and structure of food waste without changing its appearance much. Once decanted from the fermentation vessel and buried in soil, it breaks down to pure nutrient in only two weeks. This method is much faster than either worm or hot composting, allowing gardeners to amend their soil without a year of preparation. No carbon is released and little value is depleted so nutrient return to the soil is nearly 100%, Bokashi makes *supersoil!*

#### **Making bokashi starter**

It requires a fermentation process similar to culturing bacteria for yogurt or a sourdough starter. Bokashi starter is made from mill run (wheat chaff), molasses, and EM-1, a reliable commercially available microbe inoculate. Our two 5th grade classes make two 100-pound batches of starter a year, some of which we use and some of which we sell for \$5/lb. Once the starter has been mixed, packed into airtight containers, fermented for two weeks, decanted, dried, and re-packed, it is ready to use.

#### **Ferment in an airtight container**

Most small-scale bokashi fermentation is done in buckets, but we developed a larger Bokashi Blaster, which allows us to pack in 175 pounds of food waste at once. You can also add continually the container is filled. To demonstrate, we will add another bucketful of food waste to a batch started two weeks ago.

Thoroughly mix the starter with the food waste and press down firmly to squeeze out any air. When filled, seal the container. Wait a minimum of one month for the material to fully ferment (with a bucket two weeks is enough), frequently draining out any excess liquid. If need be, you can wait months, even years, to declare the bokashi finished – pickled material is preserved unchanged for a long time. When finished, remove the bokashi pre-compost and bury it deep in a garden plot or container. Wait two weeks before planting.

#### **Not so time sensitive, bokashi gives us flexibility**

Bokashi provides some flexibility in our composting program as well as introduces a completely different kind of decomposition to learn about – there are many ways to decompose organic matter, and this ancient technology is rapidly gaining in modern-day popularity. We are planning a bokashi workshop for Lanikai parents in January. As composting goes, bokashi takes the least time, space, energy, and attention than all the others. For busy parents, bokashi may be the best opportunity to convince them to compost at home.

## **Tour Stop #B3 - Making and using Biochar**

### **PYROLYTIC DECOMPOSITION**

Although wooden pallets are not a waste problem at Lanikai School, they are a huge humbug to anyone in Hawaii who is reliant on shipping – that is, everyone! Pallets come in relentlessly, but they do not go out. Our good friends at Hardware Hawaii were more than happy to give us ten waste pallets to test making charcoal last year.

Making charcoal is called *pyrolytic decomposition* – breakdown brought about by high temperatures. The volatile gases are cooked away and what is left is pure carbon. Smashed into bits, charcoal made from highly vascular pallet wood offers billions of tiny surfaces that retain moisture and provide infinite habitat for beneficial soil microorganisms. When organic material such as vermicast tea or compost is added the crushed charcoal is re-branded as *biochar*. It has a long history of adding fertility to soil as well as sequestering carbon for thousands of years.

We wrote a national grant to conduct a biochar project and were awarded \$1,000. Just last week we got our retort – a Tinman style – that will allow us to make ten pounds of charcoal at a time. Unfortunately, the heavy rains we have been experiencing lately drenched our supply of wood pieces so we were unable to fire up a batch for this Compost College event.

What you see at this demonstration is some of the biochar we made last year. Hopefully next week we will be up and burning! Our first batches will go create soil mixes to determine improved yield of various crops when grown with biochar added to the soil. We have installed three Science Beds to conduct growth experiments outside our AINA gardens.

We will also use biochar as an amendment to restore our nutrient-depleted schoolyard, a massive sheet mulching project already underway.

Subsequent batches will be available for sale. There are no biochar makers in Hawaii and shipping from the mainland is very expensive. We have already been asked by Koolau Farmers to wholesale biochar for their customers who are seeking organic soil amendments. Rob Barreca of Counter Culture Hawaii (grows crops specifically for fermenting) and Farm Link Hawaii has spread the word among organic farmers on Oahu and also asked to be on our customer list.

## **Tour Stop #B4 - SOIL MIXES**

### **Lanikai School Signature Soils**

With robust compost, vermicompost, bokashi, and biochar production on campus, we are eager to produce and scientifically test various soil mixes. The most amazing thing is that all this exciting science activity is because we at Lanikai regard “waste” as our greatest resource and have figured out how to sort it, collect it, and use it. To think this valuable material used to be tossed mindlessly into the dumpster! We want to share our knowledge in the hopes that other schools will try some of these ideas for themselves.

## Tour Stop #B5 - Compost Tea Brewer COMPOST TEA & VERMICAST TEA

Although the utilization of compost tea has not yet become widespread in Hawaii, this strategy is gaining acceptance around the world as the damage from synthetic fertilizers and pesticides becomes increasingly apparent. In California where strict regulations on toxic pollutants have been enacted within the last 15 years, every golf course, park, and sports facility in the Bay Area has made the transition from chemical to biological soil management based on application of compost tea. In 2009, Harvard University groundkeepers replaced chemical fertilizers with organic compost tea made right on campus with astounding results.

At Lanikai School, where the gardening program is expanding and ambitious plans are underway to revitalize landscaping and lawn, compost tea is the best choice for biological augmentation, fertilization and pest control. Not only is tea perfectly safe for children and the environment, but we make our very own ingredients: high quality compost and vermicast.

In September, we got a grant for a Growing Solutions System10 Compost Tea Brewer, backpack sprayer, a supply of catalyst and a heavy-duty wheeled stand.

Compost tea is most commonly used as a foliar spray and soil wash. We use the backpack sprayer to hit landscape plants on the underside of leaves where aphids and white fly are tenacious. Within a few applications, these insect pests will disappear. Vermicast contains an enzyme call chitinase, which breaks down chitin, the tough material that makes up the exoskeleton of insects. When pesky bugs walk on a tea-treated plant surface, their little feet burn and they buzz off.

A simple watering can is used to do a soil drench or soil wash, which will deliver nutrients to plants as well as organic compounds that stimulate their own hormonal defenses against disease and pests. Our 3rd graders brew tea weekly in teams of two, help with the application, clean out the tea brewer and are in charge of any tea sales to parents or the Lanikai community.

### WHY USE TEA?

#### ***Liquid most efficient, effective***

*Tea – an aqueous extract – offers the best possible delivery system for the nutrients, organic compounds, and beneficial microbes present in solid compost and vermicast.*

#### ***Water conservation***

*Tea augments soil biological activity, promoting soil aggregation and improving infiltration, drainage, and water-holding capacity.*

#### ***Less chemicals***

*Compost tea reduces the need for synthetic fertilizers and pesticides by enabling plants to access and utilize nutrients more efficiently, and by fortifying their immune system to better withstand disease and pest pressures.*

### GLOSSARY

**Compost Tea** - An aqueous extract made from seeping *finished* compost or vermicompost in water. Can be aerated or unaerated, with additives or without.

**Leachate** – Water that percolates passively through a worm bed or compost pile, usually picking up some soluble nutrients that leach into the liquid. Note: Leachate is *not* tea.

## Firing up the Tinman

### Biochar project funded and initiated

Lanikai applied for a grant from the California Foundation for Agriculture in the Classroom and was awarded \$1,000 in September for our project entitled, *Biochar*.

The objective of the project was to construct a 55-gallon biochar retort to produce charcoal, then crush, screen and inoculate the pure carbonaceous material with vermicast tea to make it **biochar**. The biochar would be added to soil in specified amounts to see if it increased crop yield in three different selected crops.

Anticipating the project would happen eventually, in August we installed three 5-foot diameter beds and readied them by filling them with mulch to break down over a few months.

Chris Fietzer (right, in blue shirt), who guided the Zero Heroes through a biochar demo last year, agreed to help us expand the biochar program. We contracted with Ed Souza, Jr., of Pacific Industrial Projects (hiding under that hat) to fabricate the cooker. He selected the tinman style from many retort designs for its simplicity, low cost, and ease of replacement. The steel drums should last for approximately 30 burns. The drums are readily available on Oahu.

We named our new tinman retort **Tinman!**

### Pyrolysis is thermal decomposition

Our first burn – pyrolysis – took place before school started, early in the morning, on October 21. We did not want students around until we were sure the situation would be safe.

Tinman is a drum inside a drum. The internal drum has pukas on the bottom. It is filled with scrap wood from shipping pallets and topped with a lid. More scrap wood is wedged in between the two





drums and piled on top. A little denatured alcohol and shredded paper to aid ignition and the fire is lit.

When the top pile of wood burns down a bit, a lid with a chimney is placed on top.

As the wood burns down the drum, the internal barrel begins to heat up. Because there is little or no oxygen in the inner chamber, combustion does not occur. Instead, the high temperature causes gasses in the wood to be released. They escape through the bottom pukas and act as a fuel to keep the outer fire going. The chimney acts as a siphon to pull air and gasses from the bottom.

When the last of the outside embers burns out at the bottom, (see photo right), the process is over and several hours are required for cooling. Mr. Sawyer took the first peek.

In the outer drum, all that was left was a few handfuls of ash. The inner drum was filled with perfect charcoal – no ash, and processed evenly through each piece – pure, vascular carbon. Ideal for retaining moisture, providing habitat for microorganisms, and sequestration.

We did a second burn with similar results. Our only problem both times was too much smoke. As anticipated, a neighbor complained. Tinman should be smoke free. Ed Souza will be making a few design modifications for the next burn to remedy this problem.



## Getting from charcoal to biochar

### Smash and screen

Two teams of two sixth graders used a tamper to crush the charcoal so that it would pass through a 1/2-inch screen. They used a magnetic pick-up wand to remove nails which immediately became a favorite tool.

The pile of crushed char was transferred to buckets. This is dirty work but no one seemed to mind. For safety, we insisted on close-toed shoes, masks, and goggles.

With only two burns, we created enough char to set up the experimental grow beds. We will continue fire up the Tinman and stockpile our biochar for a number of Science Fair projects already in the works.



*Elijah and Kaimi are working on perfecting the techniques of crushing the charcoal and sweeping the fragments with magnets to remove the nails. Lanikai wind provides quite a challenge to the process!*

*Once our charcoal harvest is crushed, it will be infused with vermicast tea. The addition of organic matter is what turns **char** into **biochar**. It will then be ready for use.*



## Third graders take on tea

Our 3rd graders, in tea teams of two or three, have agreed to brew one batch of compost tea every Thursday, including setting up the brewer and cleaning it out after each brew as their Zero Hero Service. They also help to distribute the tea around the garden or wherever Mr. Sawyer wants it to go. One Friday a month, tea will be available for sale to parents and the public. Third graders will make up the gallon jugs, affix our Lanikai School label, and help to manage the cash transactions.



*High quality ingredients make the best tea.*



*Aeration and added nutrients assure high microbial count..*



**Compost tea recipe:** Ingredients in the tea basket include 6-8 cups of vermicast and a few handfuls of compost from our oldest compost pile. Fill the brewer with 10 gallons of water, add 7 tablespoons of powered catalyst (microbe food), and plug it in to bubble for 24 hours.



*Tea time provides a treasured opportunity to acquaint 3rd graders – a few at a time – with other aspects of the composting operation. Here they take the temperature of a compost pile, watching the thermometer soar to 160°!*



**Tea Trainer:** Sixth grader Kekai is doing an extensive tea project for his Science Fair project and is already a master brewer. He is the designated trainer for each tea team, walking them through the proper procedures and protocols for set-up, brewing, breakdown and clean-up.

## New cafeteria improvements

### Wooden bowls and metal forks

Our food service waste reduction initiative continues at a steady pace.

This past month our wonderful One Love Cafe caterer Shannon Walker added attractive wooden bowls for soups and salads as well as metal forks. The people attending Compost College on October 17th were blown away by the reusable trays, fruit cups, bowls and utensils. Since they were not served milk in cartons typical with school lunch, the only rubbish they generated that day was paper napkins.

It's easy to see why disposables became so popular because – as we soon discovered – reusable washables take *a lot of work* to manage! Mr. Sawyer added a third 6th grader to the Zero Hero lunch duty team to accommodate the additional work load. The items pile up at the Separation Station and need to be organized and bussed back to the kitchen several times during lunch. The trip down to the LC that used to be accomplished by one 6th grader now requires two to handle all the trays, dishes, and forks. Besides the labor generated for students, every day Shannon has to lug all this heavy stuff from her kitchen to her truck to the school, then back to her truck and back to her kitchen – and then she has to wash it all.

Is it worth it? *Yes!* If you practice Zero Waste principles, seeing a mountain of rubbish dwindle to practically nothing delivers a mountain of satisfaction.

### Another rubbish can replaced

Without the disposable trays and food service items, our lunchtime trash content is down to crushed milk cartons, napkins, and some packaging from home lunches. It seemed ridiculous to maintain a 32-gallon trash can and plastic liner for so little, so we replaced one big 32-gallon can with a little 7-gallon trash bin with a biodegradable liner.



*Lunch duty now takes three people to handle operations – an increase in green jobs – but one less big rubbish can and plastic liner – a decrease in waste.*

## Trash Trek team triumphs

Lego League’s theme for the 2015 robotics competition was “Trash Trek,” focusing on the problem of reducing and managing trash through engineering. Teams must show competence in robots (a programmed trash truck that runs a course), a project related to the topic, and an interview. Lanikai registered two teams for District competitions held October 30th and November 7th.



Our first team, competing at Mililani High School, made quite an impression as they included Sort-It-Out Sam with their group. They handed out tangerines to the other competitors, then circled back with Sam to show everyone how to dispose of the peels and HI-5 cans and bottles. Kids stopped by our table throughout the competition to visit Sam with recyclables.

Lanikai’s team won **First Place** in robot performance and did well enough on the other components to be named an Alternate team to the State Competition!

On the way out, they spotted a big pile of trash by the parking lot – broken furniture and wooden pallets. Our team, who walk the talk of trash reduction every day, immediately recognized this as a resource. “We





could cut up those pallets to make biochar,” they said, and asked permission to haul them away. They loaded up Mr. Sawyer’s truck. So they actually did a *trash trek* at Trash Trek, showing a brilliant transition from the theoretical to the practical.

They also noted that the Trash Trek competition was very trashy, and thought that Ms. Mindy and Mr. Sawyer should talk to the organizers about this – it seemed so blatantly hypocritical.

*We are proud of our team who demonstrated brains, skills, initiative, humor, and empathy in public – so grown up!*

The second Lego League team will compete on November 7th.

## Other October visitors

### UH Manoa students

Twenty-five undergraduates taking the Horticulture Practices class at UH came by for a tour and workshop on thermal composting. Their professor is Dr. Jayme Grzebik, Director of the Oahu Urban Garden Center and Statewide Coordinator for the UH Master Gardener Program.



### Educators from Australia share stories, ideas

Our first international guests, Principal Sharni (in black dress) and Educational Coordinator Mardi (in blue dress) met with Kelly Perry (left) and Natalie McKinney from Kokua to discuss participation in the network of the Stephanie Alexander Garden Foundation. They enjoyed a wonderful lunch and got the Grand Tour of Lanikai’s gardens and resource processing operations. Australia is *miles* ahead of us – schools have had worms and hot compost for decades (bokashi was new to them), and claim extensive expertise in Zero Waste practices. They gave us some great tips and ideas we are eager to try. It was so useful and refreshing to talk with *experienced* kindred spirits.

# DA SEASON'S DEMONIC DOWNTURN...

## Diabolical Double Dumpsters!

The evil spirits got a head start in terrorizing Lanikai School early in October when out of the mist **two** new dumpsters appeared, uninvited. We were barely filling our old one in a week. When we called to ask them to haul them away, Rolloffs said no way, all schools were required to have two big dumpsters. Once again, the DOE shows how obstructionist and out of touch they are – pushing disposal when reduce, reduce and recycle is pono. Taxpayers are footing the hefty bill on our two dumb dumpsters.



## Green Waste Grotesqueries!

October zombies apparently ate the brains of our custodians, who, under the spell of the Diabolical Double Dumpsters, helplessly filled them several times over with prunings, trimmings, leaves, branches, and grass, all packed in plastic bags. There is no greater abomination than green waste in toxic plastic bags being trucked to a landfill. We will address the green waste issue in coming months.

## Body Snatchers Seize Event Organizers!

It was clear that sinister forces were at work at the student council Fiesta Friday dance and the Fall Festival, because **no one** made plans to recover food waste – and there was plenty – which ended up

trashed. This monstrosity moment alerts us to the fact that we have not yet fully activated our Zero Waste powers. The Dark Side won and only the rotting, Jack-O-Lanterns made it to the worm bin.



## Data Reveals Halloween Horrors!

October 30th was the *single worst day for waste collection* since we started collecting, a shocking **131 pounds**. Our average daily lunch waste collection is 60 pounds. On that Friday we had the popular pancake lunch, average recovery 53 pounds. That means that **SEVENTY-EIGHT pounds of trashed food October 30th was pure Halloween garbage!**

Parents may be unaware, but their children **do not eat** the endless pizza, the popcorn, the plates and plates and plates of cupcakes and cookies. They take an obligatory nibble and throw the rest away. They *do not* consume and enjoy these “treats,” which are presented to them so often that they are no longer special.

Can Lanikai parents come up with alternative, creative, more meaningful ways to celebrate and signify than to throw more and more garbage at these kids?



The bloodcurdling scream heard on the Windward side October 30th was Ms. Mindy's heart being ripped to shreds.

## Bottom line for October 2015

This report covers the interval between October 1-31, 2015. School was closed for Fall Break October 5-12. There were 16 classroom/lunch days during this period.

- Total food waste diversion rate dropped to 97% due to the failure to collect waste during a school dance and Halloween event. Total composted was **1,461 pounds** via vermicomposting, hot composting, and bokashi fermentation. Total composted since the beginning of the school year is **4,539 pounds**. To be fair, not all of this food waste came from the Lanikai campus – about 250 pounds of food was imported from outside to accommodate Compost College demos.
- 100% of all HI-5 cans and bottles were collected and redeemed.
- Approximately 95% of all paper and cardboard was collected and processed.
- *Zero* green waste was collected and processed. All was lost and landfilled.



*Beans were harvested after 7 weeks in beds amended with our own compost. Past data not available but Mr. Sawyer estimates we got **triple** the yield compared to last time beans were planted using store-bought compost.*



*Lanikai School Director Mr. Ed Noh was a big hit as Sort-It-Out Sam in the Halloween parade! Having this sky-high level of administrative support is why Lanikai's Zero Waste Revolution has come so far so fast.*

## Coming up in November

- Move forward on the biochar project – modify Tinman and start the experimental beds.
- Continue search for videographer.
- Trash Trek Regional Division competition, part 2
- Address some of our issues with green waste, etc.
- Hopefully, we will host a visit from our benefactor, Marilyn Katzman!