THINK & EAT GREEN @ School

2013-2014 Annual Report

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a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

Land and Food Systems

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August
PRINCIPLES OF LEARNING
washed your hands?

41 SCHOOLS IN VANCOUVER INVOLVED IN THE THINK&EATGREEN@SCHOOL PROJECT IN 2013-2014.

$75,000

AMOUNT OF SUPPORT TO SCHOOL-GENERATED FOOD SYSTEM TRANSFORMATION ACTIVITIES THROUGH OUR SMALL GRANTS PROGRAM SINCE 2011.

24 GRADE 4-6 STUDENTS AT TYEE ELEMENTARY THAT WERE WILLING TO TRY HOMEMADE KIMCHI AS PART OF A FOOD LITERACY WORKSHOP IN THEIR CLASSROOM.

A Year in Numbers

351

NUMBER OF UBC STUDENTS FROM THE FACULTY OF LAND AND FOOD SYSTEMS AND F ACULTY OF EDUCATION THAT WORKED WITH VSB CLASSROOMS AS PART OF ACADEMIC COMMUNITY-BASED EXPERIENTIAL LEARNING FOOD SYSTEM PROJECTS.

124

LOAVES OF BREAD BAKED WITH CHILDREN AND YOUTH IN VSB CLASSROOMS AS PART OF FOOD LITERACY WORKSHOPS LED BY 2ND- AND 3RD-YEAR UNDERGRADUATES FROM THE FACULTY OF LAND AND FOOD SYSTEMS.

1. Mission and Objectives

Policy development and adoption to increase food security in schools and decrease environmental impacts of school food systems is a major objective of our project.

Due to the urgency of our current situation and the need for action in implementing school food system transformation, the **mission** of the proposed research project is *to contribute theoretical understanding (knowledge creation) and practical applications (action and knowledge mobilization) in the areas of food education across the curriculum, multi-level food system changes (in production, procurement, distribution, delivery, preparation, and end products recycling/composting) that will support regional food security with an emphasis on environmental sustainability,* [human health] *and policy recommendations for schools.*

To achieve this mission, our project team has identified the following **objectives**:

1. Develop and evaluate food-related curricula/activities focused on food system sustainability and institutional adaptations to climate change, grounded in a food security (Availability, Accessibility, Affordable, Appropriate, Safe, & Sustainable) paradigm;
2. Evaluate with the Vancouver School Board opportunities for policy development and adaptation to increase food security in schools, decrease environmental impacts of school food systems, and promote a sustainable regional food system;
3. Link theoretical learning to practical application to educate university, high school and elementary students, teachers, and citizens (ourselves included) with a sound knowledge of the relationships between food security, sustainability, human health and climate change;
4. Pilot specific Community Impact Projects with engaged school communities and elsewhere, to investigate the adaptations needed to fulfill the above objectives;
5. Further develop the connections between community-based action research and community service learning (also referred to as community-based experiential learning) in creating community-engaged scholarship;
6. Create connections between university and community that will extend beyond this project.

Research questions

1. What are the best methods for building, managing, sustaining, and integrating into the curriculum school vegetable gardens and fruit orchards?
2. What are the best methods for increasing food and sustainability literacy amongst schoolteachers and students?
3. How can cafeterias and other school food services be integrated in the school curriculum to provide learning opportunities for all students to obtain fundamental skills of planning, preparing, cooking and consuming healthy, nutritious and wholesome meals within an agreeable, community-enhancing and inviting physical space?
4. How can community-engaged scholarship enhance undergraduate and graduate student learning of food systems sustainability?
5. What policy changes can be developed to create a sustainable school food system and at which appropriate level (school, school board, city, province) will these changes need to take place?

(Mission, Objectives and Research Questions taken from the Original Proposal submitted to the Social Sciences and Humanities Research Council of Canada, March 2010.)

2. Overview of the Year

PRINCIPAL INVESTIGATOR'S REFLECTIONS

A year of expansion of the Think&EatGreen@School project's presence in the schools and further deepening of community engagement and progress in the completion of academic plans.

2013-14 can be characterized as a year of deepening and expansion of community engagement in Think&EatGreen@School. From an original group of 15 schools that received Think&EatGreen@School Small Grants to support projects generated by school-based teams in 2011-2012 and 23 recipient schools in 2012-2013, we shared $35,000 from the grant resources (compared to $20,000 in years before) to fund projects generated by 34 school-based teams, that met and compared experiences in November 2013. We were impressed by the quality and scope of the school projects that showed a deepening of the commitment of school teams to work at the whole food cycle systemic level in the schools, linking food production-based activities through gardening and composting; food preparation, sharing and celebration and increasing food and environment related learning opportunities for K12 students.

By the closing of this report, in June 2014, the 34 schools had submitted their poster reports (http://lfs-teg-collab.sites.olt.ubc.ca/schools/elementary-schools/ and http://lfs-teg-collab.sites.olt.ubc.ca/schools/secondary-schools/.) Unfortunately the meeting of all the recipient of Small Grants schools, an important opportunity to collectively evaluate the outcome of the projects, could not be held due to the labour dispute that affected BC teachers.

Another expression of deepening and expansion of community engagement within the Think&EatGreen@School Project was the celebration of our 3rd Summer Institute in July 2013. Over 90 participants from the schools, local food and environment advocates, chefs, food gardeners and the team of academic researchers from UBC, the Vancouver School Board and Vancouver Coastal Health, joined in three days of intense activity of our community of learners at the UBC's Point Grey Campus. We had an average of 89 attendees for the three days event between presenters and participants. This year, MetroVan joined in the Summer Institute Organizing Committee and brought a large contingent of high-school students who were the highlight of the event. Delegations from Burnaby, Richmond and Coquitlam schools joined the Vancouver schools. The participants "walked the talk" of the Project's vision and planted, harvested and composted food at UBC's Orchard Garden; cooked shared and

celebrated at the university's facilities and shared experiences and reflected on lessons learned, opportunities and obstacles to change what K12 students eat at school and what and how they learn about food and environment, to advance the goals of creating healthy and sustainable food systems at school. At the end of the Institute, all participants elaborated their own plans and commitments to work in their respective schools to implement our shared vision.

Four UBC courses continued to be involved in Think&EatGreen@School (Land, Food and Community I and II, LFS 250 and 350 respectively, the Permaculture Design course at the UBC Farm and a cohort of students from the Community-Based Field Experience in the Faculty of Education, FoE 430) with 351 students involved in a variety of projects. And, for the second year a group of Teachers Candidates finishing their studies at the Faculty of Education carried out their Community Based practicum within initiatives planned and delivered through the Think@EatGreen@School Project. Details about all the above mentioned community engagement initiatives are provided in the respective sections of this report.

In addition to all the exciting developments in community engagement, we have made a sustained effort to fulfill the academic dissemination responsibilities of our Project and have basically completed data collection needed by the various research projects (http://lfs-teg-collab.sites.olt.ubc.ca/research-publications/research-projects/). This year the UBC based team of researchers has held monthly brown-bag lunch seminars and two whole day research workshops, clarified dissemination strategies and elicited commitments which were articulated in concrete publications plans. Participation in conferences **(see Knowledge Mobilization section on page 60 in this report)** and public presentations and a number of scholarly papers submitted or close to submission and 2 PhD and 3 Masters theses totally or partially supported by our Project were successfully defended, marked a truly productive year of academic work which will be shared with all the community partners and school teams to include their input in the spirit of our Community-Engaged Scholarship commitments.

Another important development has been the expansion of the number of food gardens in Vancouver public schools, which has grown from a dozen at the beginning of our Project in 2010 to 62 according to our latest data collection, an indicator of the importance of the Vancouver School Board Sustainability Policy fully supported by the collective efforts of the whole Think&EatGreen@School community-university research alliance. The VSB has also made important progress in its efforts to increase healthy and sustainable food in the food programs it offers in schools.

On April 4, 2014, a meeting of the entire community-university research alliance that sustains Think&EatGreen@School reaffirmed the interest and the desire of all team members to continue the collaboration in the future although it is not clear yet under what forms, organizational settings and leadership the network will continue, as several of the UBC based scholars that formed the academic original core of the team have retired or are in the process of retirement. At the same time, new opportunities have emerged as teams with similar composition as ours in Toronto and academics in Santiago de Chile have expressed a strong interest in forming partnerships to collaborate within wider alliances working for similar objectives.

Think&EatGreen@School enters now its 5 and last year and the whole team is ready to work even harder to complete in 2014-2015 all the objectives of the Project and leave the foundations for the continuation, expansion and deepening of the collaborations among all the partners in our community-university research alliance, building the capacity among the institutions and organizations involved to continue to work —perhaps under different organizational settings— the action and research activities needed to continue the transition towards a healthy and sustainable food system in Vancouver public schools and to link with the efforts of making Vancouver the Greenest City of the World.

3. UBC Course Involvement

"It was much more significant when we could add real, time-and-place-connected learning to the mix. It's great to see the students being curious about the things they find… trees, berries, vines, bees…"

— Alexandra Bocking

A key tenet of the Think&EatGreen@School project is involving university students in food system activities with our partner schools and community organization. There are three broad goals associated with this aspect of the project:

1. To enhance educational experiences of undergraduate students by providing an opportunity to apply theoretical knowledge through hands-on learning in a community setting.
2. To push the boundaries of conventional teaching practices in food system education in the K-12 and university system.
3. To contribute to our community stakeholders' efforts to improve school food systems within Vancouver.

This year, undergraduates from 3 courses from the Faculty of Land and Food Systems and a group of teacher candidates from the Faculty of Education were placed with schools and community partners.

Land, Food and Community I (LFS 250)

Course Description

Faculty: Land and Food Systems

Date of Course: September 2013– April 2014

Student Enrollment: 287

An introduction to managed systems and concepts of sustainability; economic, ecological and social components; managed landscapes, agri-food systems, and communities; urban and rural systems; the land, food, nutrition and human and environmental health continuum. Students made 3 visits to their partner schools between September and December and carried out one of the activities below on their last visit.

Overview

A significant portion of the second year course, Land, Food and Community I (LFS 250) is devoted to a community-based experiential learning (CBEL) activity. CBEL activities are designed to connect theoretical knowledge to real-world experiences and issues. Leaving the classroom and campus is necessary to access the diverse

ways of knowing embedded in a community food system. Since its inception in 1999, LFS 250 students have been required to leave the classroom and investigate an issue of food security in the city of Vancouver. In 2006, focus switched from the 23 communities in Vancouver to schools within the Vancouver school district. Since 2009, LFS 250 has worked with, and as part of, the Think&EatGreen@School project. LFS 250 groups have been involved in cafeteria menu assessments, stakeholder interviews, garlic planting, vermicomposting, lasagna gardening, art projects, and healthy eating activities.

In 2014, 60 VSB classrooms were involved in food literacy workshops carried out by our second year students. The menu of options presented to schools were:

- Vermicomposting
- Garden Planning
- Bread Baking
- Making Tea
- Salad in a Jar

To complement the Community-Based Experiential Learning activities, the course offers a number of lectures, workshops, discussions, readings and assignments designed to prepare undergraduate students for making connections between the theories and ideas presented and discussed in class and applied in the community-based activity.

Workshop Outlines

*All workshops were designed for approximately **60 minutes** in length.*

Vermicomposting

According to Metro Vancouver data, 44% of the materials that end up in our landfills are organic wastes. Composting is a key component to a sustainable food system and schools are ideal locations for experimenting with a variety of methods for turning our food scraps into a usable end product for growing food. One of the most desired soil conditioners on the market are worm castings, the result of having a specific species of worms, Red Wigglers, process organic waste into 'black gold'. Vermicomposting is ideal for classrooms as these systems are inexpensive, easy to maintain, and can be set up inside, allowing for year round composting.

Students involved in this activity will assist a K-12 classroom in setting up and learning to maintain a vermicomposting bin.

Resources

- City Farmer: Composting with Red Wigglers http://www.cityfarmer.org/wormcomp61.html

Garden Planning for a Spring Harvest

In Vancouver, we are blessed with a mild climate, perfect for growing vegetables in early spring that can be harvested well before the end

of the school year. LFS 250 students helped their assigned VSB classroom learn about a wide variety of plants to incorporate into a school garden to help plan and prepare for an early harvest. The workshop included starting seeds indoors in seed trays with potting mix.

Resources

- Get Growing – Resource developed by the Landed Learning Project at UBC Farm http://m2.edcp.educ.ubc.ca/landedlearning/index.php?option=com_content&view=article&id=28&Itemid=26
- Society Promoting Environmental Conservation http://www.spec.bc.ca/Resources/Documents/Food/SPEC%27s%20School%20Gardens%20Start-Up%20Guide.pdf
- A collection of resources for teachers from the Environmental Youth Alliance http://www.eya.ca/teacher-resources.html

Baking Bread

Baking bread in a classroom is a great way to get students excited about cooking. LFS 250 students visited a VSB classroom with all the necessary ingredients to make a simple bread recipe with VSB students and shared some fresh-baked bread. In small groups, everyone had a chance to touch, feel and taste their way to understanding the process of adding flour, yeast and sugar together to make a fresh loaf of bread.

Resources

- Basic Bread Recipe http://breadbaking.about.com/od/yeastbreads/r/1loafbread.htm
- Video: Making Bread http://www.myrecipes.com/how-to/making-yeast-bread-10000001905617/
- Video: Peter Reinhart: BREAD: TED Talk http://youtu.be/QtT6ICj3Yjw

Tea from the Garden

Grade Level: Grade 4 - 12

Some of the easiest plants to grow in the classroom and on school grounds also make excellent tea. This workshop will explore the tastes, histories and comforting properties of common school garden herbs (e.g. rosemary, sage, mint, and thyme). Making tea in a classroom can provide a calming routine to transition between activities and is an easy way to bring plants, the garden, and nature into the classroom all year round.

LFS 250 students presented a variety of garden herbs and wild plants and prepared tea for sharing within the classroom.

Resources

- The Mint (Lamiaceae) Family http://www.clovegarden.com/ingred/mt_mints.html
- Stinging Nettle Culinary Uses http://www.herbsociety.org.uk/kh-hedgerow-to-kitchen-nettle.htm
- How to Make Herbal Teas

http://www.motherearthnews.com/natural-health/how-to-make-herbal-teas-infusions-tinctures-ze0z1202zhir.aspx

Salad in a Jar

Grade Level: Grade 2 – 12

This workshop demonstrated the ease of creating a nutritious and filling salad for a school lunch – one that travels easily and looks beautiful! LFS 250 students brought in the necessary ingredients to create the salad (e.g. grains, vegetables, and dressing) and explored the connection between the garden and healthy eating.

Resources

- Salad in a Jar Directions http://www.thekitchn.com/how-to-pack-the-perfect-salad-in-a-jar-cooking-lessons-from-the-kitchn-192174
- Agriculture in the Classroom http://www.aitc.ca/bc/index.php?page=programs

- Barilla Center for Food & Nutrition. 'Double Pyramid: Healthy Food for People, Sustainable Food for the Planet' http://www.barillacfn.com/en/

Food Safety

- Learn about food safety www.health.gov.bc.ca/protect/food-safetymodule/files/home.htm
- Teach food safe principles to kids including hand washing www.canfightbac.org/

Cooking

- Kids in the Kitchen - Cooking tips with children (+ activities + recipes) http://www.wrha.mb.ca/healthinfo/prohealth/nutrition/files/Nutrition_2.pdf

Land, Food and Community II (LFS 350)

An introduction to tools and skills required for assessing the economic, ecological, social, and technological components of managed landscapes, agri-food systems and communities comprising the land, food, nutrition and human and environmental health continuum. Groups of 5-7 third-year students dedicate a significant amount of course time to planning, developing, implementing and evaluating a food system activity in collaboration with their community partner. Descriptions of the specific activities are below.

Course Description

Faculty: Land and Food Systems

Date of Course: September – December 2013

Student Enrollment: 200

Tyee Elementary School

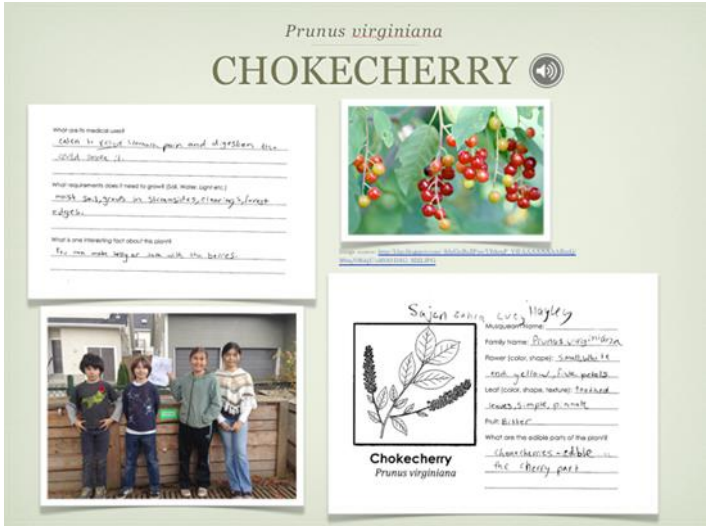
In the Fall of 2013 Tyee hosted five LFS 350 groups, three conducted food preparation and consumption workshops and two worked with the teachers on different garden-based projects.

The goals of the food preparation and consumption workshops were to create, implement and evaluate a 60 minute, hands-on workshop that engage VSB students in food preparation activities in the classroom. Each group was assigned one of the following topics:

- Baking Bread
- Making Kimchi
- Yogurt Making
- Starting Sprouts

The first of two garden-based groups of undergraduate students worked with Mrs. Lublow's Grade 4/5/6 class to create a native plant garden activity book with information and drawings for each type of plant located in the native plant garden that was installed the previous year. The native plants included: Oregon grape, swamp gooseberry, red flowering currant, Indian plumb, ocean spray, snowberry, red huckleberry, evergreen huckleberry, nootka rose, kinnikinnick, dogwood, chokecherry, salmonberry, and honeysuckle. The LFS 350 students worked with small groups of Grade 4/5/6 students to research each type of plant collecting information about the common name, scientific name, leaf shape, flower colour, a description of its fruit, a description of the part of the plant that is edible, its medicinal uses, its requirements for growth (e.g. does it require sun or shade?), and one interesting fact. The LFS 350 students also facilitated a scavenger hunt in the garden giving each group of Grade 4/5/6 students one of the plants to find, identify, and draw. After all the information was compiled, the LFS 350 students created a digital booklet that was given to each of the classes at Tyee to utilize

in hopes that it would encourage classes to use native plant garden for student learning; additionally the information was compiled into an iBook and published with images.



The second group of LFS 350 students worked with each of the classes at Tyee to plan and prepare for a Fall Pocket Market, which was hosted on November 15th, 2013 at 2:30pm. The group of undergraduate students made promotional posters, visited community shops and organizations to ask for donations, and handed out fliers at the Trout Lake farmers market. The students got donations of tea from ShakTea as well as donations of apples for the apple cider press from Nester's Market, IGA Market, Famous Foods, and Choices; the apple cider press was donated by the Homestead Emporium (www.homesteadersemporium.ca).

Each of the 8 classes made one to two items to sell at the pocket market and Mr. Malin's Grade 7 class handled all the financial aspects of the market by working with each class to determine an appropriate cost for each item and collected/counted the proceeds on the day of the market. Items sold at the market included handmade garden-themed Christmas cards, bags of mulling spices, handmade/collected packets of seeds (chives, broad beans, kale, and pumpkin), cookies, apple chips, potato print wrapping paper, popcorn, holiday shaped bird feeder ornaments, cinnamon buns, and fresh pressed apple cider. The Pocket market raised over $400 for the garden program at Tyee Elementary School.

Sexsmith Elementary School

In the Fall of 2013 Sexsmith Elementary School also hosted two LFS 350 groups who worked with the teachers on two different food waste/ composting projects. The first group of LFS 350 students worked with Mrs. Wendy Hugli's Grade 1 class by developing a series of workshops aimed at engaging students in hands-on learning around basic composting concepts using flip-charts, Q&A, storybooks, songs, waste-sorting games, etc. The students were taught what food waste products could be composted as well as introduced to the physical and chemical processes of composting. Additionally, the group set up a vermicomposter in the class to enhance the hands-on experiential learning. The second group of LFS 350 students worked with the student Green Team to implement a school-wide composting system; including establishing a three -bin composter in the garden and a demonstration vermicompost system. The LFS 350 students taught the Green Team students about maintaining the compost system and worked with them to create a compost pick up schedule.

Community-Based Field (to fork to field) Experience (EDUC 430)

Tyee Elementary School	Chelsea Murray &
Sexsmith Elementary School	John Baird & Alexandra Bella
Queen Elizabeth Elementary School	Alexandra Bocking

Overview

Following the successful completion of a 10-week in-school practicum, all UBC teacher candidates in the Bachelors of Education program completed EDUC 430, the Community Field Experience (CFE). In most cases, this three-week field experience occurs outside schools in non-formal learning environments. Research informs us that such "non-formal" educational involvement helps teachers develop a broader, more holistic view of education than a practica limited to classroom settings. The placement locations vary widely from museums, art studios, health organizations such as the Vancouver Coastal Health, outdoor recreational and educational organizations. The Think&EatGreen@School Project (TEGS) called its


$2.50
Pizza Popcorn
$2 50


Brooklyn to Manha
APPLE CHIPS
Apple chips
YUMMY
apple chips
Yummy!
No sugr add

placement location the Community-based Field (to fork to field) Experience, highlighting that the focus of this project is on the complete food cycle of a school food system including: growing produce on-site, harvesting, preparing healthy meals & snacks, sharing food together and composting. This last year was the second year the program had been in place. The Faculty of Education made a few changes to the CFE program for its second year based on feedback from many of its community partners. Some of these changes included a shorter more informal initial meeting, more structure for the teacher inquiry, and simplified feedback forms for the community partners. After a follow-up meeting with the new program coordinator, the TEGS project decided to take on 5-6 teacher candidates for the second year of the program, a significant reduction in numbers, in order to focus its energy on supporting the TEGS Small Grant Schools by partnering the teacher candidates with a number of the schools in order to help them carry out the goals and objectives of their small grant applications. Five teacher candidates were placed with the TEGS project and partnered with three of the TEGS Small Grant Schools (Tyee Elementary, Sexsmith Elementary, and Queen Elizabeth Elementary).

Dates

Secondary teacher candidates: April 28th – May 17th 2014.

Similar to the previous year, after the initial meeting with the teacher candidates, one of the TEGS GRAs (Chessa Adsit-Morris) personally met with each school to come up with a rough schedule for the three-week placement and identify a number of projects the teacher candidates would be working on during their placement. This year the focus of the school-based projects was to help the schools fulfill the goals and objectives they had established as part of their TEGS Small Grant applications. This included assessing the current status of each school's green initiatives and determining how the teacher candidates could best utilize their specific expertise to support and further these initiatives.

Placements

Inquiry/Reflection Activities

One of the main goals of the CFE was to develop, in beginning teachers, an enriched awareness and expanded understanding of the settings in which education occurs. Teacher candidates were encouraged to:

- Observe in a variety of educational settings,
- Participate in aspects of non-formal education which might inform their classroom practice,
- Recognize and articulate educational community links to local public schools,
- Develop questions to frame an inquiry into "places of learning" outside schools, and
- Collaborate with peers to share observations and develop questions.

During their three week Community-based Field (to fork to field) Experience the teacher candidates were asked to keep a journal documenting their experience and complete a number of inquiry/reflective activities. These activities included identifying inquiry questions, reflecting on meaningful and/or teachable moments, and identify barriers or obstacles encountered during their placement.

Similar to the first year for the CFE program, the teacher candidates were all given a hand-made garden journal to utilize throughout their three-week CFE placement. They were encouraged to engage in their personal inquiry practices, focusing on identifying the questions that drive them forward. The Faculty of Education decided to provide more focus and direction for the teacher candidates' inquiry practices, asking them to focus on one of the inquiry questions listed below each week:

- What types of activities did you engage in this week?
- What are you learning about the community you are working with?
- How does learning "look/feel different" in this context?
- What challenges have you encountered (with hosts, students, the work you were asked to do)?
- Have you had any "A-ha!" moments?
- What ideas/strategies could bring back to the classroom?
- Could pedagogical approaches learned in the BEd program be used in this context?

(Faculty of Education, 2014a).

However, the teacher candidates also explored other personal inquiry questions such as:

- I am interested to know if gardens can help students build and sustain socio-emotional well being? Can gardens be used to promote gender equality (or neutrality)? – Alexandra Bella.
- If we replaced all the lawns at UBC with gardens, could we feed the UBC student body? – Alexandra Bella.
- Why do students jump at the chance to eat veggies straight from the garden? – Alexandra Bella.
- How do you strike that balance between spontaneous learning and teaching the pre-determined aims of a lesson? – Alexandra Bocking.

"The support that you provided today was invaluable. It is a challenge for a teacher to take a large group of students into a small garden and keep them on task. Having other adults available made it possible for us to get a lot of work done in the garden and to take advantage of the many teachable moments that come up in the garden."

– Michelle Griffiths

Activities completed at placement

Tyee Elementary School	The teacher candidates worked with each class at Tyee Elementary School to plan and plant their garden plot, working with each teacher to connect these activities to the formal curriculum. The students planted mixed greens, snap peas, nasturtiums, native strawberries, pumpkins, and radishes. The teacher candidates also worked with small groups of students doing garden tasks such as watering the fruit trees, installing an irrigation system in the garden beds, turning/aerating the compost, weeding the native plant garden, sweeping the walkways, and they created a garden bulletin board with a map of the garden in order to track what has been planted in each of the garden beds. The two teacher candidates also made healthy snacks (hummus and earth day cookies) with all the classes at Tyee, as well as worked with a number of classes to make products to sell at the school pocket market (specifically apple chips and natural cleaning products).
Sexsmith Elementary School	The teacher candidates placed at Sexsmith Elementary School worked with a few of the Grade 4/5/6 students to install an irrigation system and create a watering manual that outlines the steps (with pictures) for watering the garden including getting the watering key, unraveling the hose, hooking up the hose, watering, and cleaning up, etc. The teacher candidates also created and installed several olla (or oya) irrigation pots, made from recycled milk jugs. The teacher candidates worked with pairs of classes to make black bean burritos using produce purchased from Fresh Roots Urban Farm. They participated in the weekly teacher green team meetings, helped the Environmental Youth Alliance (EYA) work with several classes in the garden, and made signs for the garden. The teacher candidates also moved and reinforced the three-bin compost system, working with students from several classes as well as running a few worm/compost activities with the Grade 1/2 classes. The teacher candidates worked with several classes to plan a skit for their year end celebration, one of which included changing the lyric to the song 'The Wheels on the Bus' to instead focus on sounds in the garden.
Queen Elizabeth Elementary School	The teacher candidate placed at Queen Elizabeth Elementary School worked with a number of the classes to do activities in the garden and orchard. This included facilitating a scientific inquiry by having the students complete a drawing activity in the garden, conducting a bean sprouting experiment, teaching a lesson on pollination by having the kindergarten students act out being a flower getting pollinated; another class took a walk through a local bog looking for signs of Spring. The teacher candidate also created a lesson on making mint tea during which students harvest mint leaves from the garden to make tea. She also helped make cornbread with a Grade 2/3 class as well as make arugula pesto. She helped students harvest rhubarb, radishes, and salad greens for the harvest celebration. The teacher candidate also helped to facilitate activities for the student Green Team during the lunch period and facilitated many garden tasks such as planting seedlings, turning the compost, weeding the orchard, and planting the garden beds (quinoa, amaranth, corn, broccoli, basil, nasturtiums, zucchini, and onions). The teacher candidate also wrote a blog entry (http://qeschoolgarden.blogspot.ca/2014/05/hi-there.html).

Maple Grove Elementary School

During the three-week CFE all five teacher candidates were given the opportunity each Friday to share their experiences during facilitated activities and informally while gardening or sharing food together in a weekly potluck. The location of the Friday sessions changed so that the teacher candidates had the opportunity to see and experience different sites of garden-based learning. For the second week of the CFE the teacher candidates spent the day at Maple Grove Elementary School working with Michelle Griffiths's Grade 4/5/6 class. This provided the teacher candidates the opportunity to work together as a group, learning and sharing from their collective experiences in the schools; as well as provide the TEGS project the opportunity to help one of its Small Grant Schools by providing hands-on support for its many green initiatives.

The teacher candidates worked in two groups, one group worked inside making bread and butter (by shaking whipping cream in a mason jar) and the other group worked in the garden on a number of tasks including: planting snap peas, radishes, lettuce, beets and flowers; removing sod along the fence; setting up a trellis with bamboo sticks for the snap peas; conducting a science experiment in which students take the soil temperature in covered beds and compare it to the soil temperature in uncovered beds; create a scaled map of the garden; aerate the compost and add brown (carbon) matter; and tidy up the garden area by picking up trash and sweeping the walk ways. Alexandra Bocking noted that the day gave "everyone a feeling of accomplishment, especially if – like today – you produce 6 loaves of bread, 2 cups of butter, 5 rows of snap peas, 9 new flower patches, and a whole new length of sunflowers." The 6 loaves of bread were baked the next day and shared with other classes of students at Maple Grove Elementary School; not only did this provide an opportunity for Ms. Griffiths's students to teach-out to other classes about what they had learned about making bread and butter, but it also provided the students an opportunity to get more classes involved in the green initiatives by sharing their enthusiasm and excitement.

recipes

Kale Massage Salad

- 1 large bunch of kale
- 1 tablespoon olive oil
- 2 Lemons
- Sunflower seeds
- Honey
- Sea salt
- Pepper

Preparation:

1. Mix olive oil, lemon juice, honey, salt and pepper.
2. Wash kale, remove the inner rib or stem, and tear into chip-size pieces.
3. "Massage" the kale to ensure that each piece has a coating of the dressing.
4. Add the sunflower seeds.

Hummus

- 1 (15-ounce) can chickpeas, also known as garbanzo beans, drained and rinsed
- 1 medium garlic clove, peeled and smashed
- Juice of 1 medium lemon
- 1/4 cup roasted tahini
- 1/4 cup water, plus more as needed
- 1 tablespoon extra-virgin olive oil, plus more to serve
- Salt

Preparation:

Place beans, garlic, half of the lemon juice, tahini, water, olive oil, and a big pinch of salt in a food processor fitted with a blade attachment and process until smooth. If the hummus is too thick, pulse in more water, a tablespoon at a time, until the desired consistency is reached. Taste, adding more salt and lemon juice as needed. To serve, place in a bowl and drizzle with olive oil.

Arugula Pesto

- 1 cup arugula (from garden)
- ½ cup parsley
- ½ cup basil
- ½ cup pumpkin seeds
- 1 clove garlic
- 2-3 tbs lemon juice
- 2-3 tbs parmesan cheese
- ½ cup olive oil

Preparation:

Harvest arugula and wash in cold water, spin dry. Put arugula, parsley, basil and pumpkin seeds into blender. Add garlic, lemon juice, parmesan chees to taste (start with half and slowly keep adding), blend with olive oil until you get the right consistency. Use fresh (on pasta or pizza) or freeze for future use.

UBC Farm Permaculture Design

The UBC Farm's Permaculture Design course (http://sustain.ubc.ca/permaculture-design-certification-course-ubc-farm-2013-0) worked with the teachers at Tyee Elementary School to host a design charrette and planning meeting on August 26th, 2013. Tyee Elementary School is interested in upgrading its existing landscape on the East side of the school and decided to enlist the help of permaculture design students to brainstorm ideas through the facilitation of a design charrette. During the design charrette the teachers reviewed all the food system related activities that had been completed during the previous year (including hosting pocket markets, installing and planting garden beds with an irrigation system, preparing healthy snacks, planting a native plant garden, etc.); the teachers discussed which activities they would like to continue/expand upon and which they would not; and then the group spent time brainstorming other activities and initiatives they might want to initiate in the next 1-3 years. The UBC Permaculture Design students took notes and helped brainstorm ways that the landscape could enable/inspire future food system initiatives/activities. The information gathered at the design charrette was then used to create several possible landscape designs by small groups of the UBC Permaculture Design students. The two main goals of the landscape design included: a) creating a participatory, experiential and peer to peer learning environment; and b) creating spaces where teachers, parents, children and youth can engage in and witness each step of the food cycle. The permaculture design students conducted a solar analysis of the site, a water flow analysis, a wind flow analysis, a pollination sector analysis, an access and mobility analysis, and a circulation and mobility analysis. Their designs include expanding the existing orchard by creating a terraced garden behind the existing playground, creating pollinator corridors to attract more native pollinators, create a dry creek bed and bioswale (to treat stormwater runoff and increase biodiversity) as well as create a covered entrance way for gatherings and parents waiting to pick up their children. The UBC Permaculture Design students also created a 'Plant Menu' document to help teachers create a more resilient and diverse landscape (the 'menu' included a guide for companion planting, nitrogen fixers, insect attractors, and dynamic accumulators).


SEEDS
SEEDS

4. Professional Development

ACTIVITIES

We could all feel that the energy created by harvesting, cooking, eating and composting from the UBC Orchard Garden and by experiencing all aspects of the food cycle created a positive energy that was shared by all present alike.

Think&EatGreen@School Summer Institute 2013

The Think&EatGreen@School Summer Institute focused on finding collaborative solutions to increase the knowledge and understanding of the connections between food, health and the environment across the food system in schools. This three day event provided a combination of plenaries and streamed workshops and hands-on, experiential activities which are relevant to both elementary and secondary school curricula, focusing on different components of the school food system including: food gardens and orchards; food procurement, preparation and consumption; curriculum and pedagogical innovations; school food policies; and composting and waste management. The activities of the Summer Institute are delivered by Think&EatGreen@School UBC professors, graduate students, chefs, staff and community- and area-based organization partners.

Working with others in our communities is an important part of making lasting change possible in our school districts. As such we asked participants to participate as part of district teams, which could include teachers, administrators, district staff and/or community partners. As space was limited, we asked district teams to register as groups of 4-5 key people. The 2013 Summer Institute also had the participation of a stream for high school youth leaders. Metro Vancouver and Vancouver Coastal Health played important roles as integral parts of the Organizing Committee of the Summer Institute. Metro Vancouver played an especially important role in the organizing of the participation of the Youth Leadership Stream in the Summer Institute that brought a new invigorating energy to the experience and made as well a financial contribution.

We consider that the Summer Institute was successful in providing participants with an atmosphere where they could:

- Strengthen awareness on various components of the school food system including: food gardens and orchards;

composting and sustainable waste management; food procurement, preparation and consumption; curriculum and pedagogical innovations; and school food policies. The participants provided testimonies of the value of "walking the talk" by experiencing the entire food cycle.

- Exchange youth leadership success stories.
- Engage in hands-on activities in the garden and in the kitchen.
- Eat high quality local, organic, sustainable and delicious food mostly harvested by participants and prepared by UBC chefs or from local businesses.
- Explore strategies for working with others to create collaborative solutions to increase understanding of the connections between food, health and the environment across the food system in schools.
- Increase the strength of schools teams around Think&EatGreen@School projects and plan activities at the schools for the following year.
- Learn from each other's experiences and challenges.

Several of the participants this year had participated in both of our previous Summer Institutes and we appreciated an increase in their confidence in their ability and understanding on their role in changing the entire food system of their schools. These participants are the source of great knowledge with many success stories and experiences in the process of incorporating into the curriculum different aspects of the food system. Their increased engagement and general contribution to the project has been apparent and we have been able to witness the formation of a community with a shared intention and vision.

This year we hired a graphic recorder to participate in our morning plenaries to help us put together images that captured the different aspects of the vision of the Summer Institute. The first day we concentrated on the directions and motivations to change our food system; the second day we concentrated on the weaving of connections between the school and the community; and the third day we focused on the role of Youth for Action. As a final activity we all participated in the creation of a tree that summarized our motivations for action. All of these four outcomes are now posters that have been shared beyond the participants in the Summer Institute.

Another outcome of the Summer Institute is a postcard written by each of the participants in the Summer Institute with their plan of actions for the coming school year with regard to activities they would like to develop at their individual schools. The postcard will be sent in September to all the schools that participated.

In addition to the youth leaders representatives, this year we also had participants in our Summer Institute from Richmond, Burnaby, Coquitlam, North Vancouver and Surrey. We hope that in the future these different districts will develop their own Summer Institutes based on the model already developed for Vancouver.

The 68 participant evaluations of the Summer Institute were excellent in all aspects and we could all feel that the energy created by harvesting, cooking, eating and composting from the UBC Orchard Garden and by experiencing all aspects of the food cycle created a positive energy that was shared by all present alike. We had an average of 89 attendees for the three days event between presenters and participants. It is in the plans for next year to have our Fourth 2014 Summer Institute. Due to housing development on the site of the UBC Orchard Garden, where the last three Summer Institutes have taken place, we are planning to move this event that has proven so successful to one of the schools that can offer the same facilities of garden, kitchen, eating and composting.

5. Small Grants Program

"When you give children access to outdoor exposure, you tap into an ancient connection that they share with life around them and they respond because it isn't something they find in the classroom..."

-- Tamara Litke

After two very successful years providing funding for school teams to creatively integrate school food system initiatives—related to growing, preparing and sharing food, and managing food waste–into the classroom, Think&EatGreen@School set aside $35,000 of its research funding from SSHRCC for the 2013-2014 school year. All in all, 33 elementary and secondary schools in Vancouver (24 elementary schools and 9 secondary schools) received funding for their school projects – almost double from the 2012-2013 school year!

It is always impressive to see the amount of thought and collaboration that emerges from schools forming their own 'Small Grant teams,' and this year was no different. Each school formed a team of at least three members that included teachers, parents, community partners, and community members. All were from different backgrounds, played different roles, and worked within different boundaries and challenges, yet all were motivated by the similar goals of working towards a more sustainable food system and giving students the opportunity to connect to different aspects of the complete food cycle through 'hands-on-learning' experiences.

What emerged from each unique blend of individuals working together were extraordinary project proposals that reflected individual school challenges, needs, and capacities. We were able to provide each of the 33 schools with up to $2000 for their projects that ranged in scope and size, but that all followed similar outlines determined by the following criteria:

- Involve a working team of three or more members committed to strengthening the connections within the food system at their school. This team may include teachers, administration, support staff, food service staff, maintenance staff, students, parents, or other community members. At least one team member must be a teacher, administrator, or other school staff member.
- Demonstrate a commitment to initiatives that make connections between different aspects of the school food system and provide opportunities for student learning and activities such as growing, preparing and sharing food and managing food waste.
- Involve partnerships with community-based organizations and/or other schools.

Schools were also asked to fill out self-assessment surveys based on their school's current food system sustainability initiatives, to meet with research team members from Think&EatGreen@School to share their stories of implementing their projects, and to provide a summary report at the end of the school year with photos that were then turned into posters for each of the schools to display. All school posters can be viewed at www.thinkeatgreen.ca/schools/elementary-schools and www.thinkeatgreen.ca/schools/secondary-schools.

Each of the 33 Small Grant schools have their own unique stories to share. All of them have faced different challenges and have celebrated countless successes throughout their projects. Sixteen school teams joined the returning 17 school teams from the previous year. And, although their goals may be different, with some schools looking to enhance existing school food system initiatives and others looking to start their journey of integrating school food system initiatives with learning activities, it remains clear that they all share similar motivations for engaging in sustainable food system projects. Without a doubt, every teacher, parent, community partner and community member who takes part in these initiatives are all motivated by their students. They are motivated to create as many opportunities for their students to engage in 'hands-on-learning' experiences as possible, and they are motivated to give their students as many skills as they can that will shape their lives for the better.

Although we only showcase stories from two of the 33 schools below, we would like to acknowledge the champions of each and every one of the school teams, who are all working tirelessly to give their students experiences that will help them transform into engaged citizens, healthier adults and our future leaders of tomorrow. Thank you for all of your dedication and hard work!

General Wolfe Elementary

When asked about what motivated her and her team to engage in healthy and sustainable food system initiatives at General Wolfe Elementary, Tamara Litke gave anything but a half-hearted answer. "The motivation goes deeper than what's visible and what's inside. It goes deep into our relationship with plants, our relationship with the Earth, our relationship with life, our history in rural settings versus urban spaces...and when you give children access to outdoor exposure, you tap into an ancient connection that they share with life around them and they respond because it isn't something they find in the classroom..."

The passion brought forth by Tamara and her team resonates in the stories of what they've been able to accomplish so far at General Wolfe Elementary. It all started when Tamara first went into her daughter's class and asked if she could plant sunflowers with the students. The teacher agreed, and pretty soon after that, Tamara had another teacher ask her if she could come and do the same thing with her class. The students planted sunflowers and came back after the summer only to see how big the sunflowers had grown. They were asking questions like "How

does a root eat if it doesn't have a mouth?!" Tamara realized how important it was to make this type of learning more accessible to the students, and how valuable it was to engage them in more 'hands-on' activities outside of the classroom.

The following year, Tamara was invited into ten classes and planted one hundred sunflowers. Parent volunteers started to come in and help and each class started taking on different projects. Sunflowers moved into potatoes, which moved into beans, peas and pumpkins.

Before Tamara started the sunflower projects, the school's Green Team already existed, with a focus on planting indigenous plants in the naturalized garden that has been part of the school grounds for roughly twenty years. However, recently the focus has shifted to food and how to integrate outside-inside learning concepts into the classroom. The school also has composting, street boulevards that are cared for by the school and the surrounding community, and a naturalized play space.

The Think&EatGreen@School funding has been used to pay for the addition of four new planter boxes which will be put in near the naturalized play area. Although they have not been planted yet, Tamara and the rest of her team have a seemingly endless list of creative ideas on how to best integrate the space into the classroom. Tamara and her group are focused on integrating both the traditional side of learning (through classroom visits and lessons specifically connected to the curriculum), with the hands-on-learning piece that allows children with different learning styles or needs to use spaces like the naturalized play area and also connects all of the students to the complete food cycle from planting to harvesting, to cooking, to eating, and finally, to composting.

One of Tamara's fondest memories is when one of the Kindergarten students wrote, "My favourite thing I learned in Kindergarten was how to plant a sunflower." This reflects her team's entire approach to how students should be learning. "If kids don't have access to the outdoors, then they aren't going to care about it because it's academic. It's an intellectual idea, as opposed to say recognition of the relationships that are around us..." And, it seems that countless volunteers and members of the school and community agree with this approach. Not only has Tamara set up an online watering schedule for parents from the neighbourhood who come out and water the gardens over the summer, but there are also Master Gardener volunteers working with the school, as well as countless parent volunteers who will come out to the school on weekend work days and help Tamara with whatever task she is working on.

It is clear that Tamara and her team are motivated to rebuild the relationships that can otherwise be lost by traditional approaches to learning. What's especially inspiring is that in the process of building such relationships, they have created a community of individuals who are willing to lend a hand in any capacity that they can. And, with four new planter boxes, the opportunities for further integration of food system initiatives into both the classroom and the surrounding community seem endless.

Champlain Heights Elementary

If there is any school that fully represents the image of a seed being planted, cared for and nurtured, it's Champlain Heights Elementary. Nestled on the edge of Vancouver, the forest is the school's backyard, and the familiar hustle and bustle of the city is soon forgotten once you're able to stop and admire the space that the students at Champlain Heights play and learn in. It is the perfect setting for a garden to grow and for creativity and collaboration to flourish.

Lorraine Terretta, the recently appointed principal at Champlain Heights Elementary, immediately noticed the informal use of the

school's six garden boxes, and saw an important opportunity in expanding on what had already been started. Although not a gardener herself, Lorraine says that she feels that "extending the learning past the classroom experience," and "increasing 'hands-on-learning' opportunities for students," are both integral to the learning process and an experience that she fully supports for all the students.

After attending the Think&EatGreen@School meeting in the fall, and learning about the many projects happening in other schools – all at different scales and stages in their work on integrating the complete food cycle into the classroom - Lorraine realized that with a bit of funding, the school could focus their efforts on upgrading the current planter boxes, and integrating school food system activities further into the classroom setting.

With the Think&EatGreen@School funding, the school has purchased soil, new gardening tools and seeds which have already been started in the classrooms. Access to tools was identified as a real need because teachers were having a hard time sourcing tools, and enough of them, so that all of the students could use them at the same time. Not only that, but the students are now planting their seeds in proper seed trays with greenhouse covers, and have a wider variety of seeds to choose from. By the end of June, the goal is to integrate the food from the boxes into the classrooms, with the idea that vegetables will be growing throughout the summer and into the fall for next year's students.

In terms of integrating the complete food cycle into the classroom, Lorraine feels that, that's where the opportunity lies for her and her team. Two of the school's teachers were the pilot classes for *Growing Chefs!,* a non-profit organization in Vancouver that works to bring hands-on learning into the classroom, and teaches students about growing and cooking their own food (even in the city!). That was almost ten years ago, and since then *Growing Chefs!* has been back to the school to teach the students more about the complete food cycle. Lorraine is also excited to have three worm compost bins set up in some of the classrooms, for further integration of the complete food cycle into the school space.

Although Champlain Heights may be at the very beginning stages of formally integrating the complete food cycle into the classroom setting, Lorraine and her team seem to be the right people for the job. By using past knowledge and current connections through *Growing Chefs!,* as well as building on the infrastructure already in place, the staff and students at Champlain Heights Elementary are well on their way to building a way of knowing that can be sustained and cherished by future classes and the surrounding community.

The seed has been planted and the idea has been nourished - now we must wait and watch it grow.

6. Policy Development
AND SUPPORT

A Test Kitchen model supports school kitchens by creating seasonally based menus based on locally grown, whole foods, rather than processed ingredients.

Food Procurement Learning Lab with the Vancouver School Board and Farm to School Greater Vancouver

In 2013-2014, Think&EatGreen@School participated in supporting efforts to increase purchasing of healthy, local and sustainable food in the Vancouver School Board through involvement in the Farm to School Greater Vancouver Steering Committee, which includes numerous members of the Think&EatGreen@School alliance, including the Project's Community Liaison and representatives from Vancouver Coastal Health and the Vancouver School Board. With the support of members of the Farm to School Greater Vancouver Steering Committee and additional funding through a grant from the Vancity enviro-Fund, Farm to School Greater Vancouver has been working with key individuals throughout the Vancouver School Board to create goals and actions to help change the way food is purchased for cafeterias and food programs across the district through a Food Procurement Learning. The Learning Lab model is based on a successful model implemented by School Food FOCUS in the United States. It is designed to help schools adapt their procurement systems to increase the amount of healthy, local and sustainable food being served to students. Learning Labs work alongside existing local food programs currently occurring at the school level by helping the procurement staff to buy more

local, sustainable food from their distributors and suppliers. By working at the procurement level, the Learning Lab hopes to create positive change in systemic purchasing.

The Learning Lab began with the identification of key players that make purchasing decisions at both the board and school level. Through a series of meetings and interviews to introduce the Learning Lab model, an understanding of individual and institutional obstacles and opportunities was developed. This information formed the basis for the Learning Lab session that was held on November 28, 2013 at the Water Street Café with key stakeholders from the Vancouver School Board and partners. At this meeting, where all parties came together to discuss the findings of the preliminary interviews, develop working definitions of local and sustainable, the following broad goals for the on-going work of the Learning Lab were established:

GOAL #1: Increase procurement of local and/or sustainable food.

GOAL #2: Procure foods that model sound nutritional practice for students.

GOAL #3: Create a knowledgeable and engaged school community for local, healthy and sustainable food.

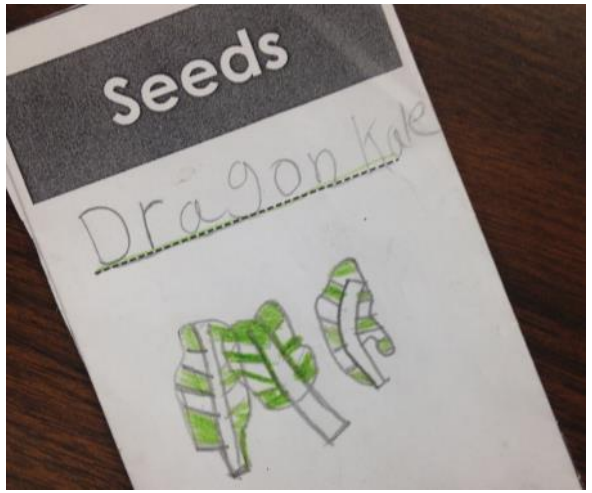
GOAL #4: Provide training and support to develop capacity to procure local, sustainable food.

The achievements of the Learning Lab to date are many. Prompted by the agreed upon goals and actions, work has been taking place with the VSB's major supplier to determine the current baseline of products purchased from our region and our province and investigate opportunities for increased local purchasing. As well, a Test Kitchen model was developed to support school kitchens to help meet provincial Guidelines for Food and Beverage Sales in BC Schools by creating seasonally based menus based on locally grown, whole foods, rather than processed ingredients. To further the development of these menu items in secondary school cafeterias, a Test Kitchen with food service staff and culinary arts instructors, where seasonally based menu items can be created, costed and portioned for use across the school district, was scheduled to take place in June 2014, but had to be postponed for Fall 2014 because of the labour dispute.

Finally, a funding application based on the goals and activities developed at the Learning Lab session in November 2013 was made to the J. W. McConnell Family Foundation's Institutional Food Fund, which is a new initiative being facilitated in partnership with Food Secure Canada, for funding to support the activities of the Learning Lab to continue for an additional two year. We found out that the application was successful in July 2014, which will help the work of the Learning Lab with the Vancouver School Board to continue until at least the end of the 2015-16 school year!

Development of Fresh Roots Urban Farm's Schoolyard Market Gardens

In 2013, Fresh Roots forged a working agreement with the Vancouver School Board to establish first-of-their-kind Schoolyard Market Gardens, at Vancouver Technical Secondary and David Thompson Secondary. These are commercially productive educational farms on school grounds, thriving neighbourhood places where inter-cultural and multigenerational knowledge sharing abounds! Fresh Roots' presence and knowledge brings stability to school gardens, and environmental and food systems expertise to the school and surrounding neighbourhood. Fresh Roots hosts Professional Development Days to help teachers from all disciplines discover how to use the garden as an outdoor classroom and achieve their specific curriculum objectives outside. The Schoolyard Market Gardens are neighbourhood food assets and a place of interaction for people of all ages, backgrounds and cultures. They are embedded in an urban context so students, and neighbours can know their farmer and experience their vegetables growing first-hand. The food grown goes into school cafeterias, local neighbourhood house food security initiatives, on-site Good Food Markets, and a weekly Veggie Box program for East Vancouver families.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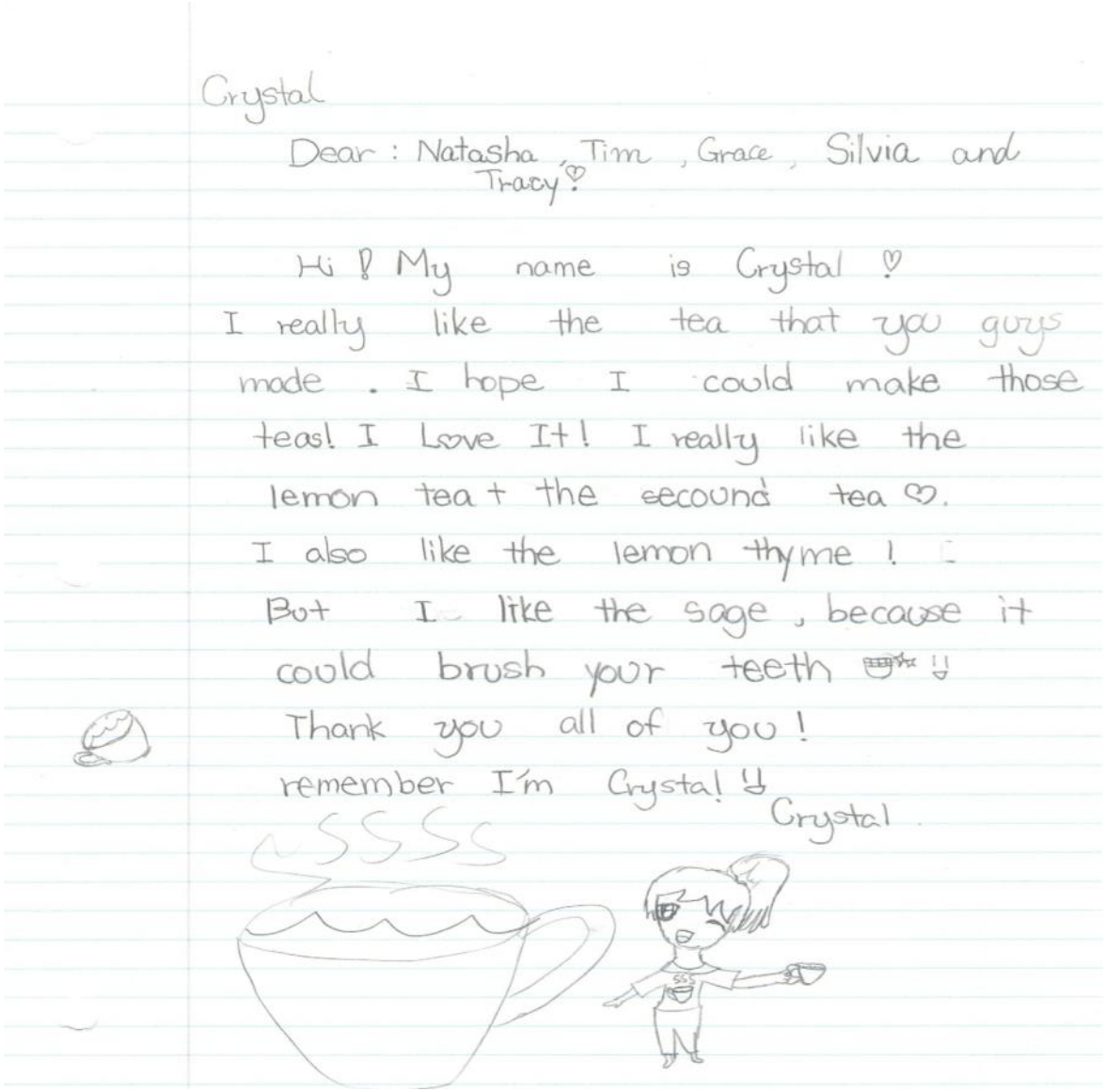
7.

Community Partner

INITIATIVES



Crystal

Dear : Natasha, Tim, Grace, Silvia and Tracy♡

Hi ! My name is Crystal ♡
I really like the tea that you guys made . I hope I could make those teas! I Love It ! I really like the lemon tea + the secound tea ♡.
I also like the lemon thyme ! [illegible]
But I like the sage , because it could brush your teeth !!
Thank you all of you !
remember I'm Crystal !!

Crystal

Farm to School programs bring healthy, local food into schools, and provide students with hands-on learning opportunities that foster food literacy.

Environmental Youth Alliance (EYA)

The following are EYA's Growing Kids Program and Summary of Activities for 2013-2014 School Year.

Schools Supported in 2013-14

- AR Lord Elementary
- Britannia Secondary
- Hastings Elementary
- Sexsmith Elementary
- South Vancouver Learning Centre
- Spectrum Alternate School
- Tillicum Annex (w/Kiwassa Neighbourhood House)

Seasonal Session Topics/ Sample Activities

Spring

- Garden Planning – mind-map/collective diagram/garden wish-list; seed orders; review successes/challenges of last year's garden.
- How do plants and animals survive the winter – hibernation, seed/plant self-protection, dormancy, perennial vs. annual plants, looking for signs of spring.
- Assess and prepare garden for planting; start seeds for transplants; start seeds for indoor gardens; do compost upkeep.
- Revisit nature spots/special trees to do spring observations.
- Establish or maintain worm bins and learn about the role of worms.
- Field trip to Stanley Park.
- Plants as Friends; Plants as Medicine – make teas and salve from wildcrafted plants and cultivated herbs.
- Garden celebration and feast.

Fall

- Harvest food, collect seeds; process seeds for storage till next year or to sell/give away.
- Plant garlic and other fall food crops; replace summer plantings with cover crops or fall plantings
- Gather mulch materials for garden beds and compost systems – learn about the

importance of fall garden care and diverse organic matter in the garden.

- Create seasonal art projects – leaf rubbings, collage or mobiles with natural materials; discussion of where things come from – not just food but all the things we use come from nature, but how do they get to us?
- Soil science – examine different types of soil, make observations, amend soil in garden beds.
- Visit nearby forested area or natural environment to observe plants, animal habitats and seasonal changes.
- Facilitated discussion of various themes – food security, urban trees, climate change.
- Explore schools grounds and create a tree (or other plant) inventory.

Society Promoting Environmental Conservation (SPEC)

The following are SPEC's School Garden Project and Summary of Activities for 2013-2014 School Year

Bayview (50 elementary students involved)

- Garden boxes were expanded to include herb garden.
- 2 classes actively involved in garden program.
- Point Grey Community church partnered as well as Bayview families to provide summer maintenance.

Brock Elementary (200 elementary students, 8 classes involved)

- Garden program expanded to 8 classes including District Extended Learning Assistance Class.
- Garden boxes were expanded to include growing potatoes in the classroom.
- Brock Junction Daycare provided summer maintenance.

Grenfell Elementary (225 elementary students, 20 secondary students, 10 classes involved)

- Built 3 bin composter with grade 3 class and Tupper Secondary students.
- Expanded to 9 elementary classes now involved in garden program K-grade 7.
- Started small scale school compost collection.

Hudson Elementary (80 elementary students, involved, 20 secondary)

- Started garden program and small school garden.
- Collaborated with Tupper Secondary students and built 3 garden boxes with Grade 3 students.
- Planted potato tubs with 3 classes.
- Partnered with "the metamovement" to fund and plan garden project.
- 3 elementary classes involved in garden program (K, gr.3 and gr.6).
- Worked with Hudson Daycare, and delivered workshops for preschool, and out of school care groups.

Kitsilano Secondary (50 elementary, 125 secondary students involved)

- New teacher took over ecology position.
- School undergoing seismic upgrade, garden on hold at present.
- Successful past summer maintenance by Kitsilano kids camps from Kitsilano Community Centre. Good harvests.

L'Ecole Bilingue (90 elementary students involved)

- French SPEC teacher delivered lessons in French to 6 classes K-Grade 4.
- School-wide composting is in place.
- Fruit trees added, donated by the City of Vancouver.
- Seismic upgrade scheduled to take place very soon.

Queen Elizabeth Elementary (299 elementary students, 13 classes involved)

- Collaborated with Master Gardener Roger Phillips who supplied us with pear trees, mason bee cocoons and expertise, teaching green school club how to prune, plant trees and clean bee cocoons.
- Orchard garden was expanded in March 2014, which now includes 9 fruit trees, 25 fruit bushes, and 3 vines. Pear tree donated by Master Gardener and 2 crabapple trees, donated by the City of Vancouver were added to the orchard.
- 4 work parties were organized to help with garden creation, pruning and maintenance, after school with families and students.
- 13 classes involved in growing potatoes in the classroom.
- Seedlings started with classes under home-made grow lights.
- Kindergarten classes were involved in growing garlic kindergarten garden.
- 8 mason bee houses constructed and erected around fruit garden.
- 13 classes actively involved in garden program K-grade 6, as well as other classes who helped in construction and garden bed creation.
- Active parent-run QE garden blog.

Thunderbird Elementary (230 elementary students, involved)

- Expanded garden to include another bed. Built by grade 6s and Russ Evans from Tupper Secondary.
- Collaborated with Thunderbird Daycare and Community Centre for summer maintenance.

Total: 1349 students at 9 schools (7 elementary, 2 secondary - including Tupper Secondary for construction of garden beds and composters.)

Public Health Association of British Columbia (PHABC)

The following are PHABC's Farm to School Program and Summary of Activities for 2013-2014 School Year.

Farm to School programs bring healthy, local food into schools, and provide students with hands-on learning opportunities that foster food literacy, all while strengthening the local food system and enhancing school and community connectedness. Established in 2007, Farm to School BC is a diverse and expanding provincial community of practice that promotes, supports, and links Farm to School activity, policy and programs across the province. Farm to School programs connect schools to nearby farmers, fishers, and harvesters, in order to bring locally grown, nutritious, safe and culturally appropriate foods into schools, and to increase local food literacy among children and school communities. These programs are an essential component of strong, resilient, and sustainable regional food systems that contribute to the health of children, community and the environment.

A Strategic Plan for Sustainability for Farm to School BC was developed in 2013 with the goal of informing and guiding Farm to School activity in BC at the provincial, regional and local levels. A set of goals objectives and strategies were developed to guide Farm to School work in BC for the years 2013-2016. The four goals for Farm to School Sustainability as defined in the Strategic Plan are:

Goal #1: Build capacity among stakeholders involved in the delivery of Farm to School to initiate, grow and sustain all pillars of Farm to School across BC.

Goal #2: Develop and nurture key partnerships that support the sustainability of Farm to School BC.

Goal #3: Inspire the growth of Farm to School in BC to increase the number of programs and enhance existing programs.

Goal #4: Advocate for policies that support local food procurement, food literacy, food skills, environmental sustainability and healthy eating in BC schools.

A broad Advisory Committee was created and first met at the beginning of 2014. A major focus of the year for the Farm to School BC Coordinator and the Advisory Committee is on the development of communication tools. Direction for the development of these tools comes from the Farm to School BC strategic plan within Goal #3, specifically Objective 3.1 - Develop supportive communication tools to demonstrate how Farm to School aligns with various sectors.

In Vancouver, the Public Health Association of BC is involved in the Farm to School Greater Vancouver Steering Committee, and the work to support the goals of Farm to School through the Food Procurement Learning Lab (see more in the Policy Support and Development section.)

8. Research, Data Collection AND ANALYSIS

Schools can play an important role in supporting healthy eating habits and providing opportunities to learn food skills.

As a federally funded research program, the Think&EatGreen@School project is devoted to knowledge production and mobilization activities as well as developing hands-on skills in the community. This section provides a brief summary of the academic research activities undertaken in 2013/14.

Collaborative Inquiry Group

Overview

Teacher Collaborative Inquiry Group

Both Tyee Elementary School and Sexsmith Elementary School participated in the Think&EatGreen@School Teacher Collaborative Inquiry Group. This initiative was undertaken to research a central research concern for Think&EatGreen@School: What are the best methods for increasing food and sustainability literacy amongst school teachers and students? The inquiry process involves a group of faculty and graduate students from the Curriculum and Pedagogy Working Group meeting with a group of dedicated teachers to facilitate and study how to support teachers in integrating the theme of food, health and environment in their practices across the curriculum. Tyee Elementary School entered into its second year participating in the Teacher Collaborative Inquiry Group research project. A Teacher Collaborative Inquiry Group was established in September 2011 at Tyee Elementary School. Participants include: 8 teachers from Tyee, one PAC parent representative, one faculty members from the Think&EatGreen@School project (Jolie Mayer-Smith), and one graduate research assistant (Chessa Adsit-Morris). Meetings happen once/month for 45 minutes at Tyee, and are recorded and transcribed to produce detailed records of school initiatives and issues. Sexsmith also had monthly hour-long meetings facilitated by one of the Think&EatGreen@School graduate research assistants (Chessa Adsit-Morris).

Tyee Elementary School

Tyee Elementary School is situated in the eastside of Vancouver in the Kensington-Cedar Cottage Community between Knight Street and 19th Avenue. This is the third year that Tyee Elementary School has been designated a

Think&EatGreen@School Project School. Tyee Elementary School and its surrounding community is highly involved in sustainable food system practices and projects geared towards helping increase food security.

Garden website: http://tyee.vsb.bc.ca/News1213/Pockt%20Market%202012%2010%2011.html

Classes: LFS 250, LFS 350, EDUC 430 (CFE), & UBC Permaculture Design Course.

Research: Collaborative Inquiry Group, Key Players.

The goal for this last year of the TEGS Small Grant was to learn how to use the produce grown in the garden in the classroom and across the curriculum areas (including in the yearly learning fair). Much of the funds were used for garden maintenance and expansion; including purchasing a new hose that doesn't kink, replacing broken or stolen tools, purchasing a new mason bee house, fertilizer, seeds, etc. The students in Grade 7 used some of the funds to amend the soil in the garden beds and upgraded the irrigation system. The school also decided to put pavers in between the garden beds in order to reduce the amount of mud and runoff created during the fall/winter rainy season. Working with parent volunteers each class made a themed paving stone to put into the garden walkway. The school also decided to expand the garden around the new/existing apple trees by planting roses, native strawberries, and blueberries along the fence between the trees in order to increase pollination and limit children from running through the orchard and damaging the young apple trees.

Healthy Snacks:

This is the first year that the teachers at Tyee were able to focus on harvesting and utilizing the vegetables grown at school to prepare healthy food to share, the teachers allocated funds from the TEGS small grant to purchase additional ingredients for each class to prepare one snack between November 2013-May 2014. The snacks prepared by the teachers included making vegetable soup, pasta sauce, apple chips, apple sauce, baked oatmeal, earth day cookies, hummus, and mixed green salads. In the Spring 2014 the school harvested produce grown in two of the beds (which were planted with the UBC CFE teacher candidates) and the Spuds in Tubs (http://aitc.ca/bc/programs/spuds-in-tubs-2/) potato bins in order to host a school-wide potato/salad day. From two garden boxes the school harvested five large bags of mixed greens, as well as radishes and snap peas. Mrs. Lublow's Grade 4/5/6 class made salad dressing for the entire school using tahini, olive oil, soy sauce, nutritional yeast, salt, paper, honey, and vinegar.

Native Plant Garden:

Tyee Elementary School worked with VSB Operations to purchase and install a small native plant garden in a small plot located next to the entrance of the school. The plants installed include Trumpet Honeysuckle (also known as Monster Berry because it was thought only monsters ate the berries), snowberry (which has white waxy berries), mountain ash, wild rose (whose dried flowers are eaten for vitamin C), gooseberry, Oregon grape, and foxglove (used for medicinal purposes). The green team received the approval of Musqueam to use the indigenous name of the plants in the signage and educational materials.

Composting:

This was also the first year that the school was able to use the organic food scraps they collected and composted in the garden beds to amend/enhance the soil quality and productivity. The students at Tyee Elementary School were integral to all of the garden-based activities, they were in charge of collecting food scraps from classroom and communal/staff areas, turning the compost, adding 'brown' matter (leaves, newspaper and other carbon based materials), tracking the compost temperature, sweep the garden walkways, and weeding. After working with parent volunteers to build a three bin composting system at the end of the first year, Tyee Elementary School spent the year initiating a school-wide compost program, initiating a collection schedule, tracking the progress (by charting the temperature and volume of the compost each week), and making sure that the system is maintained by adding dry leaves (to increase carbon), and turning it over weekly. Each class was given a metal compost bucket to collect organic waste during snack & lunchtime, and students were tasked with taking the compost out daily. Many of the teachers began to bring organic waste from home to compost in the new three-bin system. Initially the

Sexsmith Elementary School

Sexsmith Elementary School is situated near Langara College and the Oakridge area (59th and Ontario). Sexsmith has been an active Think&EatGreen@School school for the last two years, establishing a cooking program and small raised bed garden. This past year, after moving into a new school building – which included the creation of a new garden site consisting of five garden beds, a three-bin compost system, picnic tables, graded pathways, and a secure water source – the teachers began working with the Environmental Youth Alliance (EYA) to work in the garden each week in order to connect the garden to the classroom curriculum. Most of the Sexmsith Green Team activities this past year focused on working to integrate the garden produce and locally grown organic produce into the Thursday lunch program by establishing a fresh salad bar. The teachers also worked to establish a school-wide compost system with the help of their student Green Team. On Earth Day the teachers facilitated a school-wide event during which students were rotated through various activity stations focused on teaching the students about composting.

Classes: LFS 250, LFS 350, FNH 473, & EDUC 430 (CBFE).

Research: Collaborative Inquiry Group, Key Players.

School Food Environment Assessment Tool (SF-EAT)

About SFEAT

The School Food Environment Assessment Tool (SFEAT) is an interview and observation framework designed to help us learn about school food systems from school administrators, food service staff, and direct observation of schools. Our research team examined aspects of the entire food cycle, including school food gardens, availability of healthy and environmentally sustainable foods, and composting. We assessed how these elements were integrated with school curriculum and how school food policies support healthy and sustainable food systems. In the 2012/2013 school year, we visited an additional 7 elementary and 6 secondary schools, reaching a total of 34 schools since the project began in 2011.

What will we do next?

Data analysis is currently underway and our research team will share the findings with the VSB, Think&EatGreen@School stakeholders, and the academic community as soon as the results are ready. The co-investigators involved in the SF-EAT tool are intending to do another round of data collection in the near future.

Individual Eating Assessment Tool (IEAT)

About IEAT

The Individual Eating Assessment Tool (IEAT) is an online questionnaire that was designed to document what students in grades 5-8 eat and drink during the school day (either during school hours or on their way to or from school) and what percentage of students in grades 5-8 are currently participating in school food or nutrition related activities. In Spring 2012, 950 students in 20 elementary and 6 secondary schools participated in the IEAT survey study.

Take home message

The majority of Vancouver students are not consuming fruit, vegetables, whole grains or low fat milk each day at school, although many students are consuming sugar-sweetened beverages, minimally nutritious snacks and foods purchased off-campus daily. Schools can play an important role in supporting healthy eating habits and providing opportunities to learn food skills.

What will we do next?

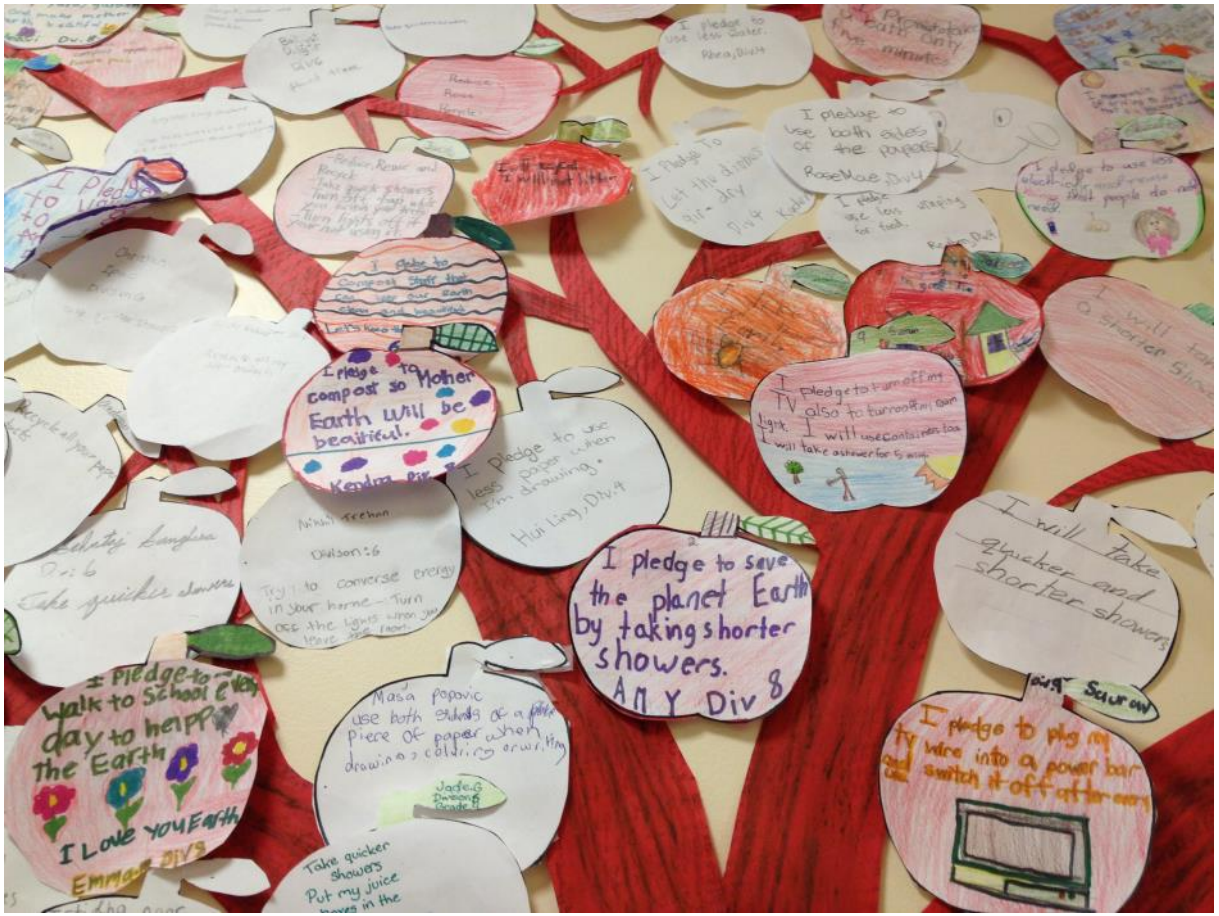
Our preliminary findings were reported to participating teachers and principals in June 2013: http://thinkeatgreen.ca/2013/07/09/preliminary-report-from-tegs-food-practices-on-school-days-study/

Our research team continues to analyze data to examine how dietary intake and food purchasing practices are shaped by various factors including food insecurity, socioeconomic status, acculturation, and gender. We will continue to share our findings with schools, the academic community and Think&EatGreen@School partners as the analyses are finalized.

Key Players Project

A full Report was written and shared within our team and a scholarly paper capturing the principle findings of the Key Players interview study was submitted in August, 2014 to the University of Saskatchewan Engaged Scholar Journal. The abstract of the paper submitted is as follows:

The "Key Players" research study is a part of the Think&EatGreen@School (TEGS) that aims to document the experiences of important actors within the movement towards healthy and sustainable Vancouver public school food systems and related learning opportunities. By interviewing Key Players in the Vancouver school food movement, we found that meaningful collaboration is a critical component in creating



rich learning experiences that result in a more holistic and integrated perspective of food systems. The TEGS Project is guided by principles of Community-Based Action Research (CBAR), an iterative process using community-university collaboration to identify opportunities, generate knowledge, and devise and implement locally-appropriate action to create desired change. Capturing the stories and experiences of Key Players represents an important step in articulating the learning emerging from this collaboration. Key Players commented on important networks, challenges, "success stories," and styles of leadership that facilitate successes. The Key Players study has assisted the community of learners involved in TEGS to better understand practices that constitute 'seeds of change,' to use these seeds to replicate positive actions, and to refine and strengthen the direction of the TEGS project overall. A full report has been completed and the material will be disseminated in academic and public media.

Focus on Food

Stephanie Shulhan's MSc Thesis, *Focus on food: A study of food culture among Vancouver secondary school students* was successfully defended in April, 2014. The abstract is as follows:

The industrial model of agriculture and food systems has led to environmental and soil degradation, loss of biodiversity, and an increase in the prevalence and availability of inexpensive processed foods that are high in calories and fats but low in micro-nutrients (Lang & Heasman, 2002; Muller, Schoonover, & Wallinga, 2007). The transition to a healthier and more sustainable food system will require increased involvement from various stakeholders participating constructively in all aspects of the food system. Promoting this kind of food citizenship among young people, in venues such as public schools, holds great potential for facilitating broader food systems change (Rojas et al., 2011). To do this requires an understanding of young peoples' current eating and food-related practices and the influences on those practices, including the deeper meanings ascribed to different types of food selections and behaviours.

The Focus on Food study reported here seeks to understand food culture among grade 9 and 10 students in Vancouver, as well as how they frame their food choices. I conducted small semi-structured focus groups during which student participants discussed their lunch selections and typical eating behaviours, their perceived influences on those behaviours, and their experiences and opinions about various ways of eating that resonated with them.

The study found that participants often framed food as either "good" (usually harmless) or "bad" (often coinciding with being harmful) products. Most participants said that they valued natural foods and ingredients, whereas they were suspicious of those that seemed artificial or unfamiliar. Participants described attempts to avoid or resist "bad" foods and to seek out "good" ones, and many wanted more information about and/or control over the foods available to them. Some participants expressed dissatisfaction with disengaged eating experiences (like fast food consumption), and said that they would prefer more engaged food experiences, such as preparing and enjoying their own "good" food. Initiatives to promote healthy, sustainable, and enjoyable eating should continue to engage students in constructive and hands-on food-related learning activities, during which they can acquire skills and knowledge while positively contributing to human and ecological health.

9. Knowledge Mobilization

ACTIVITIES

In 2012 the City of Vancouver sent 5,500 trucks worth of food waste to the landfill, enough to fill about 96 olympic sized swimming pools.

Refereed Publications

- N. Jordan, J. Grossman, P. Lawrence, A. Hammon, W. Dyer, K.V. Cadieux, A. Rojas, S. Ahmed, V. Singh, T. Michaels, C. Tzenis, 2014. New Curricula for Undergraduate-Food System Education: A Sustainable Agriculture Perspective. In press, NACTA Journal, 2014.
- Ahmadi N., Black J.L., Velazquez C.E., Chapman G.E. and Veenstra G. 2014 "Associations between socio-economic status and school-day dietary intake in a sample of grade 5-8 students in Vancouver, Canada." Public Health Nutr. 1-10.
- Black, JL. Local Food Environments Outside of the United States, "A Look to the North: Examining Food Environments in Canada", Local Food Environments: Food Access in America, Taylor and Francis. Published summer 2014.

Papers Under Review

- Black JL, Velazquez CE, Ahmadi N, Chapman GE, S. Carten S, Edward J, Shulhan S, Stephens T, Rojas, A. 2014. "Sustainability and Public Health Nutrition at School: Assessing the integration of healthy and environmentally sustainable food initiatives in Vancouver schools", Public Health Nutrition.
- Velazquez CE, Black JL, Billette JM, Chapman G, "Examining Differences in School-Day Dietary Practices between Elementary and Secondary School Students in Vancouver", J Acad Nutr Diet.

Conference Presentations

- A. Rojas. 2013: Community Based Experiential Learning on Sustainable Food Systems at UBC's Faculty of Land and Food Systems. The Land, Food and Community Series. Food-System Curriculum Workshop. University of Minnesota, St. Paul, Minnesota. November 9-10, 2013.
- M. Koc. Breaking the silos for Critical collaboration. Think&EatGreen@School Project. A model for Food Studies. CAFS Conference. Saint Catherine , June 2014.

Public Presentations

- A. Rojas, 2013. Third Think@EatGreen@School Annual Meeting of the Advisory Committee. November 29, 2013.
- Rojas, 2013. Community Based Experiential Learning and the Think&EatGreen@School Project. Video recording, TEDx Talk nomination, August 2013, Collinwood Community Centre, Vancouver. http://lfs-teg-collab.sites.olt.ubc.ca/
- Rojas, A. 2013: The Think&EatGreen@School Project. Transform education and every school into a space of hope. Public lecture, Pontificia Universidad Catolica de Chile, October 4, 2013.
- Rojas A. & Orrego, E. 2013. The Think&eatGreen@School Project and the practice of Community-Based Action Research within community-university research alliance. A whole day workshop deliver to 20 professors at the Pontificia Universidad Catolica de Chile, October 9. 2013.
- Mansfield, B., Millsip, K., Carten, S., Labow, I. and Marcure. I. (2013) Weaving Partnerships for School Food System Change. Workshop Presentation, BC Food Systems Network Annual Gathering, Shawnigan Lake, BC. July 6, 2013.
- Mansfield, B. (2013) Making Change Through Community Based Food System Research and Learning. Panel Presentation, Transformative Food Connections Forum, Capilano University, North Vancouver. October 1, 2013.
- Mansfield, B. (2013) Making Change Through Community Based Food System Research and Learning: Changing How Campuses Learn and Eat through Coursework. Webinar Presentation, Campus Food System Project. October 8, 2013.
- Mansfield, B., Millsip, K., Carten, S. (2014) Weaving Partnerships for School Food System Change. Workshop Presentation, Food for Thought: Progressive Governance Forum, Vancouver. April 5, 2014.

Graduate Student Theses

— Shulhan, S (2014). *Focus on food : a study of food culture among Vancouver secondary school students*. Master's Thesis. The University of British Columbia, Vancouver, Canada.

Abstract:

The industrial model of agriculture and food systems has led to environmental and soil degradation, loss of biodiversity, and an increase in the prevalence and availability of inexpensive processed foods that are high in calories and fats but low in micro-nutrients (Lang & Heasman, 2002; Muller, Schoonover, & Wallinga, 2007). The transition to a healthier and more sustainable food system will require increased involvement from various stakeholders participating constructively in all aspects of the food system. Promoting this kind of food citizenship among young people, in venues such as public schools, holds great potential for facilitating broader food systems change (Rojas et al., 2011). To do this requires an understanding of young peoples' current eating and food-related practices and the influences on those practices, including the deeper meanings ascribed to different types of food selections and behaviours. The Focus on Food study reported here seeks to understand food culture among grade 9 and 10 students in Vancouver, as well as how they frame their food choices. I conducted small semi-structured focus groups during which student participants discussed their lunch selections and typical eating behaviours, their perceived influences on those behaviours, and their experiences and opinions about various ways of eating that resonated with them. The study found that participants often framed food as either "good" (usually harmless) or "bad" (often coinciding with being harmful) products. Most participants said that they valued natural foods and ingredients, whereas they were suspicious of those that seemed artificial or unfamiliar. Participants described attempts to avoid or resist "bad" foods and to seek out "good" ones, and many wanted more information about and/or control over the foods available to them. Some participants expressed dissatisfaction with disengaged eating experiences (like fast food consumption), and said that they would prefer more engaged food experiences, such as preparing and enjoying their own "good" food. Initiatives to promote healthy, sustainable, and enjoyable eating should continue to engage students in constructive and hands-on food-

related learning activities, during which they can acquire skills and knowledge while positively contributing to human and ecological health.

— **Stephens, T** (2014). *Participation in school food and nutrition programs and associations with dietary psychosocial and behavioural outcomes among Vancouver students in grades 6-8*. Master's Thesis. The University of British Columbia, Vancouver, Canada.

Abstract:

Background: Diet-related health conditions, including obesity and type 2 diabetes, are a growing concern among Canadian youth. In Canada, there is also a rising interest in the impact of dietary choices on environmental sustainability. Several school food and nutrition programs (SFNPs) have been implemented to improve dietary quality and environmental sustainability, including gardening and food preparation programs. However, limited research has examined the links between participation in SFNPs and dietary psychosocial and behavioural outcomes. **Purpose:** To examine healthy and environmentally sustainable dietary attitudes, expectations, choices, and practices, and current participation rates in SFNPs among Vancouver students in grades 6-8, and to evaluate whether participation in SFNPs is associated with these outcomes. **Methods:** A cross-sectional study was conducted in 26 schools in Vancouver from March-June, 2012 (n=937 students). Schools were selected using non-probability sampling. A web-based survey, including a food frequency questionnaire, measured student demographic characteristics, participation in SFNPs, and dietary psychosocial and behavioural outcomes. Rao-Scott corrected chi-square tests were applied to assess associations between SFNPs and outcomes ($p<0.05$). **Results:** Less than 50% of students reported participating in SFNP activities, with the exception of recycling (51.2%). Greater than 50% reported the importance of health and environmental sustainability when making food purchases, and agreement that food choices impact health or the environment. However, < 50% of students reported daily intake of most healthy and weekly intake of most environmentally sustainable dietary choices. Approximately 1/3 of students reported weekly purchasing from convenience food establishments. Participation in activities specific to learning about food or nutrition was greater among females, and secondary school students reported greater participation in food-specific activities. Activities specific to learning about food or nutrition demonstrated expected associations with outcomes. Most associations between hands-on food-related activities were in the unanticipated direction. **Conclusions:** Findings demonstrate marginal participation in SFNPs and intake of healthy and environmentally sustainable dietary choices among Vancouver students. Results also reveal the possible role of activities specific to learning about food or nutrition in promoting healthy and environmentally sustainable diet-related outcomes. Further research on SFNPs to inform curriculum changes could improve student dietary behavioural outcomes, student health, and environmental sustainability.

Reports

The Dirt on Composting in the VSB

(compiled by Matthew Kemshaw)

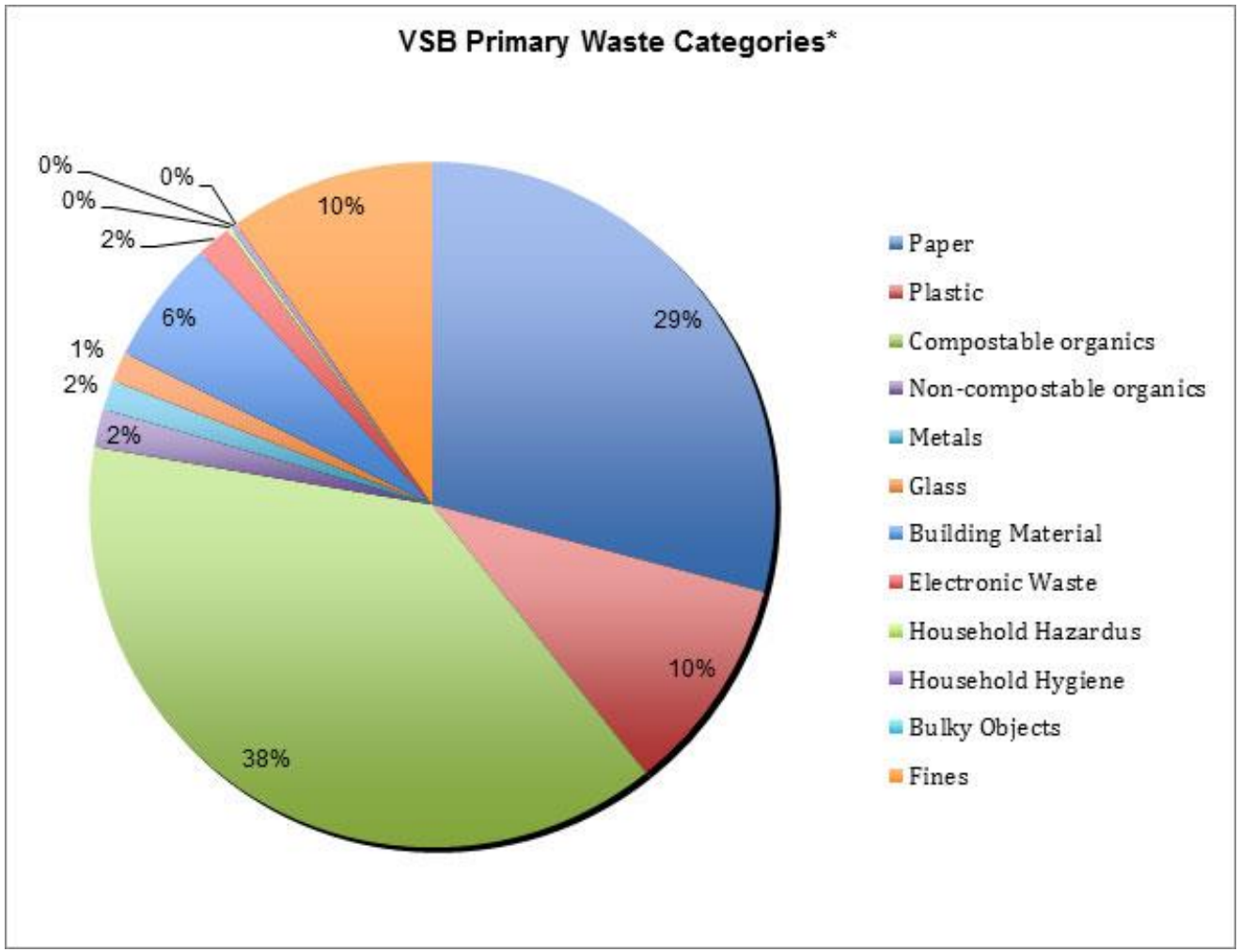
This information was compiled by the Think&EatGreen@School project to support student and staff leaders to understand and communicate about their school's new compost collection program.

What happens to compost in the garbage?

A 2010 waste composition study found that 38 percent of the garbage produced by Vancouver schools was food waste.

In 2012, Metro Vancouver sent about 450,000 tonnes of food waste to the landfill, enough to fill up 280 olympic sized swimming pools. The City of Vancouver sent 5,500 trucks worth of food scraps to the landfill, enough to fill about 96 olympic sized swimming pools. Squished under layers and layers of other garbage, our food waste breaks down in the absence of oxygen and turns in to 2 things:

Leachate; a nasty liquid goop (pronounced LEE chayt). While the Vancouver Landfill has a high tech system to keep liquid leachate from polluting our groundwater, the less leachate we can produce, the better! In 2013, the Vancouver Landfill collected 1,843,245 cubic metres of liquid leachate (enough to fill 737 olympic pools),



which was shipped to and treated at the Annacis Island Wastewater Treatment Plant at the cost of $2.1 million.

Methane; a really potent greenhouse gas, which stinks like rotten eggs. Methane is 10 times more effective as a greenhouse gas than carbon dioxide. Methane from landfills is a significant contributor to global warming, also known as climate change. The Vancouver Landfill is a world-class facility and is able to collect about 60% of the gas produced in the landfill. Some of what is collected is used as fuel to heat local greenhouses, while the rest is "flared" or intentionally burned at the landfill.

It's important to know that food waste DOES NOT help break down other garbage in the landfill. Its presence forces the landfill to devise expensive and inefficient systems to manage the 2 big by-products mentioned above. Organic digesters are a much more efficient way to use organic waste to produce methane and other gasses for energy production – commonly known as biofuel.

What happens to compost in the green bin?

Instead of being piled up with layers and layers of other garbage, our compost is strategically mixed with other organic material (like leaves and woodchips collected from around the City). It isn't squished under layers of plastics and other inorganic garbage. Instead, it's piled up in large "wind rows" - essentially a fancy name for big piles. This is all managed at a facility in Richmond called Fraser Richmond Soil and Fibre.

Technicians at Fraser Richmond Soil and Fibre make sure all of the organic materials are properly mixed so that they break down naturally, in a similar way to healthy backyard compost. Conditions are created to ensure the pile has good airflow and lots of oxygen, which invites a whole bunch of fungi, bacteria and invertebrates (the FBI) to break down all of our organic waste in to 2 things:

Soil: Soil is essential to all of us. Healthy food is grown in healthy soil. Many of the materials to make the clothes we wear were grown in soil (for example, cotton). By composting our food waste, instead of throwing it in the garbage, we help make lots of energy rich soil that can be used to grow more plants to help feed our community's needs (animals and plants included!).

Carbon dioxide: CO2 is produced by the organisms that break down our compost. While CO2 *is* a greenhouse gas, it traps much less heat

energy in our atmosphere than does methane and is a natural by-product of organic decomposition. The CO2 released in organic decomposition is an important part of Earth's natural carbon cycle.

Rich, finished compost isn't gross at all, but is an essential thing we all need to survive. What's really gross about compost is seeing it wasted in landfills.

It is now illegal to put compost in the landfill – A policy overview

Metro Vancouver

In 2011 the Province of British Columbia approved Metro Vancouver's Integrated Solid Waste and Resource Management Plan (ISWRMP). "The overriding principle of the ISWRMP is the avoidance of waste through an aggressive waste reduction campaign and through the recovery of materials and energy from the waste that remains." The plan asks Metro Vancouver to aspire towards reducing the waste generated per capita to 90% or less of 2010 levels by 2020. The plan also sets a firm target for the entire region to move from a 55% waste diversion* rate in 2011 to at least 70% by 2015, with an aspirational target to achieve 80% diversion by 2020. In 2012, one-third of the region's landfilled waste was comprised of compostables, thus organics diversion has been identified as a key way to achieve the ISWRMP's ambitious targets.

Following from this, Metro Vancouver will introduce a ban on the disposal of organics in 2015. The ban will apply to all residents and businesses in the region. This means *everyone* will have to separate food waste from garbage. Community input on how to roll out an organics ban was collected between February 25th and June 15th of 2014. A proposal for the ban was presented to the Metro Vancouver Board on September 11, 2014. It was recommended that as of January 1, 2015, all deliveries to the landfill should contain no more than 25% organics as assessed by visual inspection. This represents less than 5% of all loads currently arriving at landfill – and will impact large producers of organic waste first, such as food distributors and retailers. As of January 1, 2016, the threshold will fall to 10% organics and then to 5% starting in 2017. Educational notices to those in violation of the ban will be given in the first 6 months of the program. Beginning in July of 2015, a 50% surcharge of the tipping fee will be given to loads in violation of the ban.

City of Vancouver

Preparing for this ban, the City of Vancouver has approved a 3 phase approach to diverting organics from its waste stream. This approach is part of a larger zero waste action plan the City is working towards to support its goal of becoming "the world's greenest city" by 2020 (http://vancouver.ca/green-vancouver/zero-waste.aspx).

- **Phase 1** begun April 22, 2010 - City allowed single family and duplex homes to add raw fruit and vegetable kitchen scraps to their yard trimmings in green bins for composting collection.
- **Phase 2** was implemented over two years beginning in 2011 - City allowed single family and duplex residents to add the full spectrum of food waste (fruits, vegetables, meat, fish, dairy, bread, cereal products, and food soiled paper) in their green bins and converted to weekly collection of organics and every-other -week collection of garbage.
- **Phase 3** began in 2013 and involved working with Metro Vancouver and the private waste hauling and organics materials processing sectors to develop and implement options for diverting food waste from multi-family residential buildings and the business community (including the VSB).

With the organics waste ban planned for 2015, commercial and institutional operations have to re-negotiate their own waste service contracts to separate organics in order to avoid additional surcharges on tipping fees at the landfill (this includes the VSB). This shift is being further supported by community-based social marketing and public education campaigns led by both Metro Vancouver and the City of Vancouver.

Vancouver School Board

In 2014 the VSB started rolling out an organics diversion program throughout all facilities in the district. The program enhances the current recycling program, which has been in place for many years. The program will allow the VSB to be compliant with metro Vancouver's upcoming organics ban. New zero waste stations will be placed in strategic locations throughout all VSB sites, where employees and students can

separate and dispose of all organic, recyclable and waste materials. Organic waste will be collected from schools by Waste Management and taken to Fraser Richmond Soil and Fibre.

On September 26 of 2011 the Vancouver School Board (VSB) released a draft ***Resource use and waste reduction action plan***. The draft policy document identifies several key topic areas of connection between waste handling and the VSB's broader Sustainability Framework, including: resource use and waste reduction, education and organizational culture, procurement and supply chain management, and technical design standards. By reducing resource consumption and the generation of waste across all VSB operations, the *Resource use and waste reduction action plan* aims to align VSB operations with the regional developments discussed above.

The *Resource use and waste reduction action plan* is complemented by the ***Food action plan*** draft released October 3, 2011. While the *Resource use and waste reduction action plan* was clear in setting firm operational goals that can be easily tracked with measurable progress indicators (i.e. the 100% ban of organics from the waste stream), the Food action plan is a more forward looking document that sets out a number of strategies and goals to enable the VSB to "become a leader in just and sustainable school food systems." These strategies and goals are not as easily measured and require a significant cultural and behavioral shift to be fully actualized. A number of sub strategies and goals within this plan have implications for the way organic waste is handled and utilized in schools. The first strategy to foster an organizational culture that understands the relationships between food, health and the environment cites the management and support of on-site in-vessel composting systems as an important step towards realizing this goal. Other goals of the *Food action plan* include: reducing food-related waste and fostering an understanding of closed loop systems, and designing school sites in a way that promotes a healthy food environment, while providing a vibrant learning environment that promotes student engagement in the food system. All of these goals suggest an important role for organic waste resource recovery through active on-site composting *within* Vancouver schools.

There are a number of schools within the VSB that currently have **onsite composters** that process some fruit and vegetable scraps. The VSB's school garden policy, passed in February of 2010, outlines a process to support schools interested in installing small school composting systems and gives design specifications for a rodent resistant compost bin with a volume of ~1 meter cubed. The school board has also installed 3 Earth Tub in-vessel composters at Grandview, David Thompson and Windermere schools. The Earth Tub (made by Green Mountain Technologies) was designed specifically to compost food wastes on-site and is reported by the manufacturer to process up to 150 pounds of food waste per day. The VSB is also investigating industrial composting systems that would allow schools to compost cooked foods such as meat, dairy and breads as well disposable serving ware on school grounds.

* The process of diverting waste from landfills. Key strategies include: waste reduction, recycling and composting.

Media

"Agriculture blossoms at Vancouver Schools". Interviews with Kevin Millsip & Alejandro Rojas. 24 Hours, Vancouver, January 22, 2104

"BC Food Systems Network Hosts Meeting". Comments from Brent Mansfield. Comox Valley Record, February 20, 2014. http://www.comoxvalleyrecord.com/community/246201341.html

"Locavore Central". Article with Steve Golob & Joanne Bays. 2014 Maclean's University Rankings Issue. November 3, 2013

"Recipients of President's Awards For Staff". Steven Golob for Global Citizenship. September 9, 2013. http://www.focusonpeople.ubc.ca/blog/2013/09/recipents-of-2013-presidents-awards-for-staff/

"Say Yes to Think & Eat Green at School." Review of Alejandro Rojas & Elena Orrego's FoodShare Presentation, Ryerson University Sustainability Matters website, Ellen Pit, May 7, 2014. http://rusustainability.ca/2014/05/say-yes-to-green-at-school/

"Vancouver Think&EatGreen@School program brings teachers, community members and students of all ages together -and out of the classroom- to help build resilient local food systems". Interview with Alejandro Rojas, Alternatives online, Genevieve Fullan, June 18, 2014. http://www.alternativesjournal.ca/community/blogs/mouthful/thinking-eating-green-starts-school

"Vancouver: El Futuro Verde ya esta Aqui" ("Vancouver: A Green Future is Already Here"). El Mercurio, Revista del Domingo. Features Think&EatGreen@School as an expression of the City's vision of Vancouver as the Greenest City in the Words". Sebastian Montalva, March 3, 2014

Website and Social Media

Think&EatGreen@School maintains an online presence through its website and social media accounts. The website http://www.thinkeatgreen.ca had over 5000 individual visits between July 1, 2013 and June 30, 2014. In the previous year the site had just over 2800 visitors. The twitter account @thinkeatgreen has 770 followers. In the July 1, 2013-June 30, 2014 @thinkeatgreen made 235 tweets of which 68 were retweeted. The Think&EatGreen@School Facebook page has 174 likes. Posts are simultaneously posted to Twitter and Facebook. Followers/fans/visitors of the online presence are primarily from Canada but includes visitors from Chile, the USA, Mexico and Argentina. Think&EatGreen@School also maintains a mailing list. The number of subscribers has gone from 104 as of June 2013 to 178 on June 27, 2014. The emailed newsletters have an 'open rate' averaging 47.2%. An average of 12% who open the newsletter are interested enough on a story to click through to the full story on the website.

Collaborations

A new Food Systems Curriculum Consortium: Minnesota

Think&EatGreen@School Principal Investigator Alejandro Rojas participated in Minnesota in a seminar organized by Nicholas Jordan that included 4 universities from the USA and UBC represented by Alejandro. A scholarly paper was submitted –and is currently in press—including 14 authors belonging to the six universities (U. Minnesota, UBC, U. Montana, U. Davies. The group later included Faculty of Land and Food Systems faculty members Hannah Wittman, Will Valley and Andrew Riseman.

The vision for the consortium is of a network that links a wide range of educators and institutions that works to identify a set of "core competencies" around systemic/holistic approaches to food and "food work" and that shares and lifts up innovations wherever they may emerge in the network. The group is exploring prospects of transformational funding from various public or private funders,

Chile

Over the last two years, a sustained dialogue, including two meetings and seminars in Chile has taken place with a team of Chilean scholars from two universities (Catholic University of Chile and Diego Portales University), municipalities and the NGO Matriztica, interested in a partnership with the Think&EatGreen@School team to develop a similar project in Chile.

The idea has evolved into the concept of a municipal eco-farm, that will be a community hub where public schools and university teams will converge to learn together and implement local sustainable food system initiatives. The municipalities of Huechuraba in Santiago and Quillota, close to Santiago, are already committed to provide land to make the eco-farms.

Toronto

Two meetings have taken place in Toronto to develop a partnership in this city with a team of scholars, food advocates, and educators from the Toronto School District, Ryerson Polytechnic University's Food Security Program and the organization FoodShare.

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