



# SUSTAIN 3S03 Course Report

## Fall 2019





# A Review of SUSTAIN 3S03 Fall 2019

In September 2019, another fantastic cohort of students took part in SUSTAIN 3S03 – *Implementing Sustainable Change*. Students from all six Faculties and the Arts & Science Program engaged in interdisciplinary, community-based, student-led, and experiential education related to sustainability. Led by instructor Dr. Michael Mikulak, with support from Teaching Assistants Eric Howarth, Gabrielle Gonsalves, and Garry Vinayak, students had the opportunity to examine the concept of sustainability by focusing on specific case studies and examples in relation to larger questions of power, knowledge, and human and non-human agency. Lectures, tutorials, and assignments were focused on developing truly interdisciplinary conversations that consider the different techniques and tools society has at its disposal for addressing the environmental crisis.

During the first week of classes, 44 students formed 15 project groups based on their individual interests in sustainability. To complement their theoretical knowledge of sustainability, each student group undertook an experiential learning project of their choosing. To offer support, guidance, and ensure students had the opportunity to work with members of the McMaster and broader community, 22 individuals formally accepted the role of Community Project Champion by offering their time, resources, and expert knowledge to assist students in achieving their project goals. Additionally, countless members of the community participated in events, provided feedback through consultation, and offered mentorship. The tremendous amount of community support and engagement is illustrated by each group in the pages to follow.

As you read this report, you will notice that the breadth of student interests related to sustainability is far-reaching. Project activities include: evaluating the effectiveness of 50 newly-implemented bee homes on campus; engaging Hamilton youth to determine obstacles to using active travel in their neighbourhood; and implementing a process to collect, refurbish, and donate computers to local kids in need. It is my hope that you enjoy reading this report as much as I have enjoyed my experience in working with the individuals who have created it.



*Kate Whalen*

**Kate Whalen**  
**Senior Manager**  
**Academic Sustainability Programs**

# Department, Program, and Course Overview

## Academic Sustainability Programs Office

The mission of McMaster's Academic Sustainability Programs Office is to inspire in all students a desire for continued learning and inquiry through experiential education. To realize our mission, we strive to provide students with opportunities to take part in interdisciplinary, student-led, community-based, and experiential learning focused on sustainability. To achieve our objectives, we offer a number of programs, including The Sustainable Future Program.

## The Sustainable Future Program

The Sustainable Future Program consists of a suite of four undergraduate courses, which are open to students from all Faculties. In addition to providing students with opportunities for interdisciplinary, student-led, community-based, and experiential learning about sustainability, the Program aims to build reciprocal relationships between students, community members, and the University, to engage all parties in the journey towards a sustainable future.

## SUSTAIN 3S03 — Implementing Sustainable Change

SUSTAIN 3S03 is the third-year, one semester course within the Sustainable Future Program. Students come from Faculties across campus to learn about sustainability and to tackle real-world sustainability challenges within the McMaster or broader community. Supported by their Community Project Champions, student teams work together to evaluate problems and implement sustainable change.

# SUSTAINABLE DEVELOPMENT GOALS

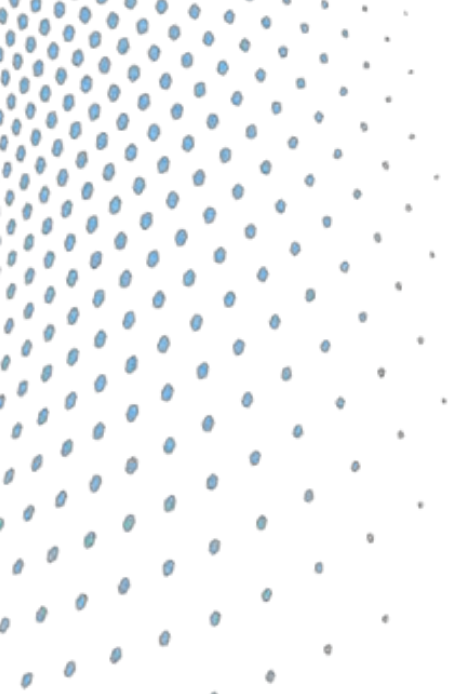
McMaster’s commitment to sustainability is evident in its placement in the first rankings to assess university impact related to the UN’s Sustainable Development Goals. McMaster ranked second in the world in the 2019 Impact Rankings by Times Higher Education.

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future.<sup>1</sup>

As part of our ongoing commitment to the goals, we’ve indicated the SDGs that align with each project in this report, which you will see depicted in the pages to follow. Listed below are the 17 goals and a brief description of each.

 <p><b>1</b> NO POVERTY</p>	<p>End poverty in all its forms everywhere</p>	 <p><b>2</b> ZERO HUNGER</p>	<p>End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	 <p><b>3</b> GOOD HEALTH AND WELL-BEING</p>	<p>Ensure healthy lives and promote well-being for all at all ages</p>
 <p><b>4</b> QUALITY EDUCATION</p>	<p>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>	 <p><b>5</b> GENDER EQUALITY</p>	<p>Achieve gender equality and empower all women and girls</p>	 <p><b>6</b> CLEAN WATER AND SANITATION</p>	<p>Ensure availability and sustainable management of water and sanitation for all</p>
 <p><b>7</b> AFFORDABLE AND CLEAN ENERGY</p>	<p>Ensure access to affordable, reliable, sustainable, and modern energy for all</p>	 <p><b>8</b> DECENT WORK AND ECONOMIC GROWTH</p>	<p>Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all</p>	 <p><b>9</b> INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>	<p>Build a resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</p>
 <p><b>10</b> REDUCED INEQUALITIES</p>	<p>Reduce inequality within and among countries</p>	 <p><b>11</b> SUSTAINABLE CITIES AND COMMUNITIES</p>	<p>Make cities and human settlements inclusive, safe, resilient, and sustainable</p>	 <p><b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	<p>Ensure sustainable consumption and production patterns</p>
 <p><b>13</b> CLIMATE ACTION</p>	<p>Take urgent action to combat climate change and its impacts</p>	 <p><b>14</b> LIFE BELOW WATER</p>	<p>Conserve and sustainably use the oceans, seas and marine resources for sustainable development</p>	 <p><b>15</b> LIFE ON LAND</p>	<p>Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>
 <p><b>16</b> PEACE, JUSTICE AND STRONG INSTITUTIONS</p>	<p>Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive</p>	 <p><b>17</b> PARTNERSHIPS FOR THE GOALS</p>	<p>Strengthen the means of implementation and revitalize the global partnership for sustainable development</p>		

\*Images adapted from United Nations Sustainable Development Goals (2019).<sup>1</sup>



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# Mapping Community Desires for Friendly Streets

## Student Authors

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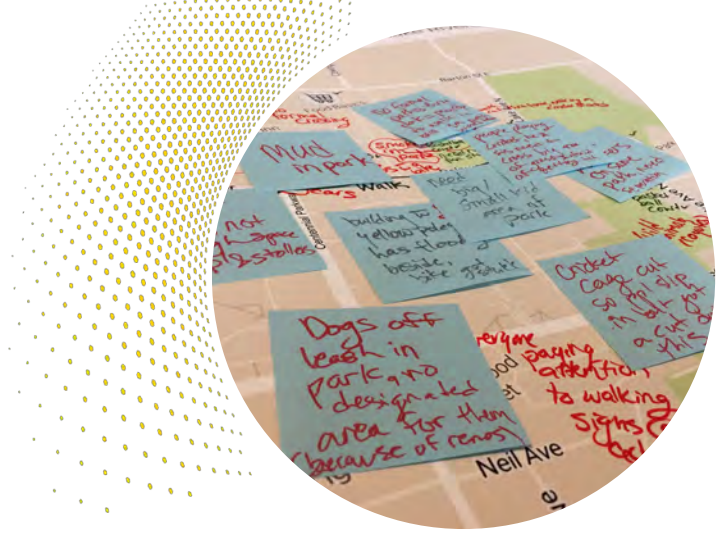
**Hannah Feldman**, Arts & Science

**Teresa Rogalinski**, Social Sciences

## Community Project Champions

**Beatrice Ekoko**, Friendly Streets (Environment Hamilton)

**Waverley Birch**, Friendly Streets (Cycle Hamilton)



Map of Centennial (Riverdale) neighbourhood annotated by students with routes, obstacles, and possible solutions.

Photo credit: Hannah Feldman

## Overview

Walking and biking are critical modes of travel in the creation of a sustainable city. Through their work on the Friendly Streets project, Cycle Hamilton and Environment Hamilton describe a “friendly street” as both vibrant and safe.<sup>1</sup> Evidence suggests that street design has a powerful impact on the way people choose to travel.<sup>2</sup> For example, dense, gridded street networks with street features, such as benches and trees, lead to more walking and biking.<sup>2</sup> While much has been done to investigate the impact of

street design on adult mode choice, it remains unclear how street design affects how young people travel. The aim for this project was to understand travel routes and mode choices made by youth in Hamilton’s Centennial neighbourhoods, specifically the Riverdale neighbourhood. Further, this project seeks to understand obstacles faced by youth who use active modes of travel and capture their suggestions for making their neighbourhood streets friendlier.

## Objectives

1. Engage youth in fun and interactive data-collection workshop
2. Identify routes taken, modes used, and obstacles faced by Riverdale’s youth
3. Share findings and recommendations for improvement

## Reporting

We hosted nine workshops with roughly 200 Lake Avenue Elementary School students between grades four and eight. Through our engaging data-collection workshops, we gathered information about routes students take to get to major destinations; methods of transportation that students use to get to destinations; current obstacles students face when walking or cycling; and finally, their suggested improvements to make active transportation safer and more appealing in their neighbourhood. Students enjoyed being able to annotate the large-scale maps of their neighbourhood, expressing the things they like, problems they face, and ways to improve, all in a way that was easy for them to communicate. In addition to the workshops, we also conducted a neighbourhood walking audit to gain a deeper understanding of our study area. Ultimately, the students shared how they mainly walk to destinations and tend to travel within the local neighbourhood to the school, Eastgate Square, and nearby parks. The most prominent obstacles discussed related to crossing major streets, feeling unsafe with heavy traffic, litter on sidewalks, limited street lighting at night, poor snow removal, and poorly maintained equipment and fields in the school park. The largest barrier to biking was a fear that their bikes would be stolen. The children proposed small scale interventions, such as increasing crossing guards and trees, to large scale redesigns, such as building an ice-skating rink, transforming parking lots into parks, and creating a skateboard park. With the information and insights gained, we created a summary report of our findings, updated the interactive map on the Friendly Streets website with the students’ feedback, and shared a social media report on the Friendly Streets blog. We hope this information will enable Friendly Streets and the Hamilton community to continue their work on creating friendlier streets for all.

## Collaborators

We would like to thank our Community Project Champions, Waverley Birch and Beatrice Ekoko, from Friendly Streets, for their support, assistance, and guidance throughout the duration of our project. We would also like to thank the staff and students at Lake Avenue Elementary School for allowing us to conduct workshops with them and gain a better insight into the community.

# Piloting a Bicycle Buddy Program at McMaster

## Student Authors

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## Community Project Champions

**Elise Desjardins, Wilson Leader**

## Overview

Cycling is a sustainable, convenient, and healthy mode of transportation that offers many short and long-term benefits to individuals and communities. University campuses are ideal locations to promote cycling, given that they attract a large number of trips from students who may form travel habits that continue later in life.<sup>1</sup>

Cycling mode share among McMaster students remains quite low at approximately 3%.<sup>2</sup> McMaster does not currently have any programs to support cycling adoption among students. Given that McMaster already has much of the necessary infrastructure, such as bike lanes on campus, connected routes to student housing, and bike share hubs, there is an opportunity to further promote cycling, which would also help the

## Objectives

1. Identify how best practices of other bike buddy programs can translate to McMaster
2. Identify barriers and opportunities to McMaster students choosing cycling as a mode of transportation
3. Pilot a bicycle buddy program on campus and determine areas for improvement
4. Create a toolkit for implementing a bicycle buddy program at McMaster

## Reporting

We began our project by consulting known literature and assessing how the information could translate to a bike buddy program at McMaster. We reached out to the well-established bike buddy program at the University of Washington Transportation Services, and they provided us with invaluable information on the logistics of their program.

To identify student perceptions of barriers to cycling and gauge their interest in a bike buddy program at McMaster, we also ran an online survey that got 50 responses. We found that the greatest barriers to cycling include not feeling safe when riding in traffic and not knowing about safe, comfortable bike routes. A bike buddy program is well-positioned to help remove these barriers through encouragement and education. Furthermore, 46% of student respondents would be interested in a bike buddy program at McMaster.

With the help of our project champion, we paired an experienced cyclist with a novice cyclist in order to pilot a bike buddy program. Following the pilot, the novice cyclist expressed a significant increase in confidence and knowledge. The novice cyclist explained that “I have always wanted to use cycling as my main mode of transportation but never felt comfortable or confident to do so. Now I feel I have gained the skills and knowledge I need to ride on my own, in and around the McMaster community”, demonstrating the impact that a bike buddy program can have among university students who commute to or near the campus.

The information gained throughout this project has been compiled into a toolkit that includes recommendations based on our lessons learned. The toolkit was shared with campus stakeholders, including McMaster’s Residence Life Office and the Student Wellness Centre. This toolkit can serve as a roadmap to guide the future implementation of a successful bike buddy program at McMaster.

## Collaborators

We would like to extend our sincere thanks to our Community Project Champion, Elise Desjardins, for her guidance and mentorship throughout the project. We would also like to thank Ma’ayan and Rosa for their enthusiasm to participate in the pilot program. Thank you to Alice Ven from the University of Washington Transportation Services, for her openness and willingness to share information about their program. Finally, thank you to Kate Whalen from McMaster’s Academic Sustainability Programs Office and our teaching assistants, Gabrielle Gonsalves and Garry Vinayak, for their support and constructive feedback along the way.



From left, Rosa and Ma’ayan enjoying a chilly November bike ride!  
 Photo credit: Rosa Stalteri

University meet its sustainability goals and the objectives of the Okanagan Charter<sup>3</sup>.

Encouragement and education have been identified as two best practices for promoting cycling among students.<sup>1</sup> Universities and municipalities alike have initiated bike buddy programs, which draw on both best practices. These programs involve pairing a new bicyclist with an experienced mentor to teach them the ins and outs of urban cycling. This has proven to be successful at increasing the confidence of new riders, cycling frequency, and fostering social bonds.<sup>4</sup> Thus, the goal of our project was to pilot a bike buddy program at McMaster.





# The Green Room Certification in Residence Program: Energy, Water, and Transportation

## Student Authors

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## Community Project Champions

**Katie Fitzgerald**, Residence Life

## Overview

Sustainability is a popular topic in many official sectors. There are many challenges around this topic globally, and students' roles are not out of this scope.<sup>2</sup> The Green Room Certification (GRC) Program, was initiated at McMaster in 2018 with the goal to educate students about their impact on the environment and to promote sustainable living to students in residence. Through learning about and using the GRC checklist, students can evaluate their level of sustainability, get green room certified, and live more

## Objectives

1. Understand current students' habits as they relate to energy, water, and transportation
2. Provide Green Room Certification to students in accordance with the GRC checklist
3. Evaluate and measure the effectiveness of the program in fostering sustainable habits

## Reporting

We collaborated with the other GRC group, which focused on food and waste to survey students about their current sustainable lifestyle habits. With 25 respondents, the survey was used to refine the GRC checklist, placing emphasis on areas that require improvement based on the collected data. The data, which projected the most significant results, were around the topic of transportation and electricity usage. For instance, less than 10% of students take active modes of transportation (i.e. bike). In our workshops, we focused on introducing students to Hamilton's bike share initiative, SoBi, in our first workshop and featured a documentary about Water & Energy in our second workshop.

Through promotion and engagement efforts by means of a Facebook group, posters, and drop-in sessions, our group was successful signing up 50 students to complete the GRC checklist. In the end, 20 students in total were Green Room Certified for completing various requirements of the GRC checklist.

All 20 respondents of a follow-up survey reported that taking part in the GRC initiative was effective in helping them enhance their daily habits. Due to the success of the GRC project, we recommend to expand this project to other residence buildings on campus in order to have a more sustainable community at McMaster.

## Collaborators

We would like to thank our Community Project Champion, Katie Fitzgerald, for her extraordinary support throughout the project. Another special thanks to the students of Whidden Hall for being enthusiastic to participate in this project and being an inspiration for McMaster community. Last but not least, it was a great pleasure to work with members of the SUSTAIN 3S03 instructional team: Kate Whalen, Gabrielle Gonsalves, and Garry Vinayak.



Certificate and checklist  
Photo credit: Nava Najafabadipoor

sustainably. Due to the success of the program in 2018, and with the GRC checklist already created, McMaster's Residence Life department chose to again partner with SUSTAIN 3S03 to expand the program in 2019. As such, the goal for our project is to inspire students to live more sustainably with a focus on energy, water, and transportation. We collaborated with the GRC group focused on food and waste (see p. 8) to increase our effectiveness.

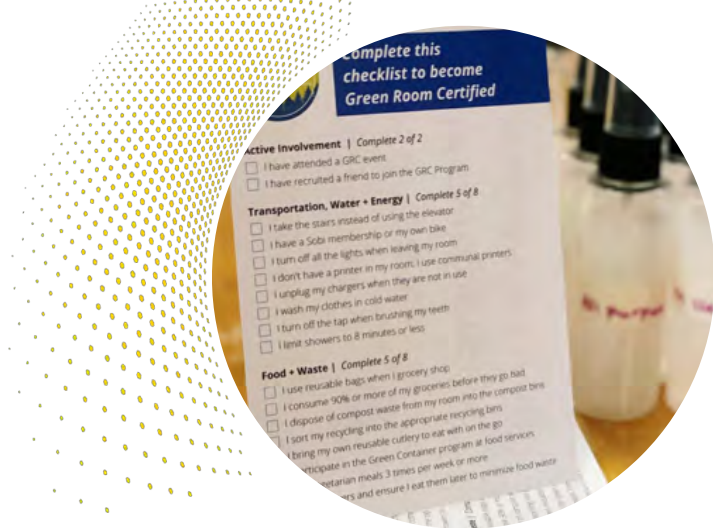
# The Green Room Certification in Residence Program: Food and Waste

## Student Authors

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## Community Project Champions

**Katie Fitzgerald**, Residence Life



The Green Room Certification Checklist and cleaning supplies made using all-natural ingredients, pictured during the drop-in session at Whidden Hall  
 Photo credit: Meghna Annapoorna

## Overview

McMaster University produces an astounding 902,378 kg of organic waste per year.<sup>1</sup> While education is listed as the fourth 'E', according to models of sustainability<sup>2</sup>, higher educational institutions are notorious for not weaving sustainability into their curriculum<sup>3</sup>. The Green Room Certification (GRC) Program was initiated at McMaster University in 2018 with a goal to educate students about sustainable practices while living in residence.<sup>4</sup> Due to the success of the program in 2018, McMaster Residence Life chose to partner with SUSTAIN 3S03 to expand the program

in 2019. The project challenge was presented as an opportunity to two student groups. It was decided that our partnering group would focus on energy, water, and transportation and our group would focus on food and waste. The goals of our project were to educate residence students about different food and waste strategies that they can implement to live more sustainably and to engage students in the process.

## Objectives

1. Create opportunities for students to learn about and implement sustainable practices in residence
2. Provide students with educational tools on how they can incorporate sustainability beyond residence
3. Certify students who complete the GRC through strategies relating to food and waste

## Reporting

Our group worked with the *Energy, Transportation, and Water* group (see p. 7) to survey students about their current sustainable lifestyle practices, which helped us tailor our educational and engagement strategies. Despite significant promotion and communication efforts, only two students attended our first event, Sustainable Spa Night. We cancelled our Sustainable Movie Night since only one person registered. We learned that it was difficult for students to invest a significant amount of time to attend an event. Thus, we planned one session with a series of activities, hosted in a casual drop-in style. Our activities included a waste sorting game, a quiz to test students' knowledge of campus composting locations, a community building activity for students to share their sustainable living tips, and a green cleaning workshop where students created natural cleaning supplies. The success of our drop-in session was incredible with 56 student participants. Upon completion of our project, 98 students signed up for the GRC program. We asked them to fill out the GRC checklist through an online survey, and through this 20 students participated and were successfully certified. From their responses, we were also able to identify areas of opportunity, including the provision of more information about composting on campus, which we hope can be included in a future GRC workshop or event.

## Collaborators

We would like to extend sincere thanks to our Community Project Champion, Katie Fitzgerald, for her guidance and support throughout our project duration. In addition, we would like to thank Gabrielle Gonsalves, Garry Vinayak, and Kate Whalen from McMaster's Academic Sustainability Programs Office, for providing guidance instrumental to our group's success. Furthermore, we would like to thank the first-year students living in residence at McMaster University for attending our events and taking part in the Green Room Certification Program.

# Catering Sustainable Events at McMaster

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## Community Project Champions

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Sustainable Catering at the 3S03 Experiential Project Showcase  
 Photo Credit: Grace Kuang

## Overview

What we consume significantly contributes to climate change; we need to assess our consumption to reduce our impact. With respect to our diet alone, over 60% of agricultural greenhouse gas emissions come from meat (mainly beef) and dairy production.<sup>1</sup> By adopting a plant-based diet, which is based on foods derived from plants, with few or no animal products<sup>2</sup>, we could reduce food-related agricultural emissions by as much as 15%.<sup>1</sup> At

McMaster, Hospitality Services has implemented several sustainability measures, including adding more plant-based food options to their Student Value Catering Menu. In support of these efforts, the goal of our project is to inspire environmentally-friendly food choices by further enhancing plant-based options on the Student Value Menu.

## Objectives

1. Understand which plant-based food items are ordered most often
2. Incorporate enticing plant-based food items onto the Student Value Menu
3. Trial the newly-added plant-based items at a catered event

## Reporting

To achieve our first objective, we collected statistics from Hospitality Services indicating which plant-based items are ordered most often from the Student Value Menu. These items include the cookie platter, nacho platter, veggie platter, and combo pack. The plant-based items ordered least often include sandwiches, breakfast menu items, and pizza. We were surprised to see that pizza was not a popular menu choice made by students, and we learned that it was because the pizza was made without cheese. However, we also learned that plant-based cheese options are readily available.

Based on our findings and in collaboration with Hospitality Services, we identified opportunities for menu enhancement. For our second objective, we incorporated three more sustainable food items: vegan pizza, made with nut cheese; plant-based boxed salad served in compostable boxes; and a halal barbeque pizza. We indicated menu items as vegan, vegetarian, halal, and gluten-free, allowing consumers to deliberately choose items that are both environmentally-friendly and align with their dietary preferences.

Lastly, we worked with the Academic Sustainability Program Office to cater the SUSTAIN 3S03 Project Showcase using the Student Value Menu. We also designed and created ingredient cards so that attendees can make informed and sustainable choices.

## Collaborators

We want to thank our Community Project Champion, Catherine Young, for her guidance on the project and connecting us with our other collaborators. We would also like to thank Chef David Fisher, for his partnership on the new menu items. We also want to thank Abbie Little and Diana Romero Acosta for their partnership to arrange the catering for the Project Showcase. Additionally, we want to thank Kate Whalen, for her continuous support and advice throughout the entire project. Lastly, thank you to our course teaching assistants, Gabrielle Gonsalves and Garry Vinyak for their support throughout the term.

# Hungry for Knowledge: Student Food Insecurity at McMaster

## Student Authors

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## Community Project Champions

**Jaimie White**, Meal Exchange  
**Shemar Hackett**, VP Education MSU



Fresh produce at Mac Farmstand,, providing students nutritious and affordable food  
Photo credit: Mac Farmstand

## Overview

Meal Exchange is a non-profit organization that focuses on tackling issues related to food insecurity on post-secondary campuses in Canada. Hungry for Knowledge is the largest cross-campus study conducted by Meal Exchange. Food insecurity is understood to be limited or inadequate access to food due to insufficient finances.<sup>1</sup> In 2018, a study conducted by SUSTAIN 3S03 students in collaboration with Meal Exchange and

McMaster Student Union at McMaster University found that 39% of students surveyed encountered moderate food insecurity; while 12% experienced severe food insecurity. However, only 24% of students utilized the supportive services offered on campus.<sup>2</sup> The goal of our project is to increase the efficacy of and access to food support services at McMaster University.

## Objectives

1. Conduct a needs assessment of student food support services at McMaster University and other Ontario universities
2. Create a report of findings, outcomes, and recommended next steps
3. Share the findings with the various campus stakeholders

## Reporting

We identified and consulted campus stakeholders from five groups and departments working towards tackling food insecurity at McMaster. We found that, for example, the Food Collective Centre provides students with fresh and budget-friendly produce, an on-campus food bank, and the Lockers of Love initiative; Hospitality Services has put in place services such as Cards for Humanity, a pay-it-forward initiative at Bridges, as well as budget friendly meals at all of their major locations; and the Student Wellness Centre provides students with cooking and gardening programs, breakfast during exams, and free fruit on Fridays. Through our stakeholder consultation, we also learned about various challenges, such as the barriers to communication with students and between stakeholders, and the stigma surrounding food insecurity that results in under-utilization of available resources.

We explored best practices by University of Western Ontario, Lakehead University, and Carleton University. Lakehead University has implemented the Food Security Committee, a multi-stakeholder committee that consists of students, faculty, and administration. The council addresses the issue of food insecurity inspiring us to recommend a food security council for McMaster.

To fulfill our second and third objectives we created a short report with our findings and recommendations and shared it with our stakeholders.

## Collaborators

We would like to give a special thanks to our Community Project Champions, Jaimie White and Shemar Hackett, as well as all the stakeholders involved. We would also like to thank the Sustainability 3S03 instructional team for their continuous support throughout the project.

# Greening The Grind

## Student Authors

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## Community Project Champions

**Alexandrea Johnston**, McMaster Students Union



Representation of the relative burden on the consumer to support re-use in our current culture

Photo credit: H.G Watson

## Overview

Canadians are the third largest global consumer of coffee per capita, consuming approximately 152 litres per person annually.<sup>1</sup> Coffee consumption also translates into coffee-cup waste generation from the shops that provide them and the customers who accept them. Established in 2017, the Grind Cafe is the newest coffee shop at McMaster. As of fall 2019, The Grind only served coffee in single-use, paper and plastic-lined cups, did not

provide an option to compost the empty cups, and did not advertise a discount for customers who brought their own. However, the 2019 McMaster Students Union (MSU) VP Finance was eager to improve the sustainability of The Grind and sought opportunities for support and collaboration with SUSTAIN 3S03. As such, the goal of our project was to recommend strategies that will help to eliminate coffee cup waste at The Grind.

## Objectives

1. Understand customer perceptions of behavioural nudges to bring their own cup
2. Analyze data to determine what will motivate sustainable behaviours
3. Identify and share proven sustainability strategies that could be adopted by The Grind

## Reporting

To understand customer perceptions of behavioural nudges, we surveyed 162 students about three different sustainable practices, which each had various levels of support: (1) implementation of various monetary incentives for bringing in a reusable cup, (2) the removal of single-use coffee cup lids, and (3) replacement of current plastic-lined cups with china or corn resin-lined, biodegradable cups.

Through our analysis, we saw support for all proposed behavioural nudges: the establishment of a loyalty punch card (87%), a discount for bringing in a reusable cup (79%), and the removal of single-use coffee cup lids (85%). Additionally, we identified that customers are more inclined to use a reusable cup over a single-use, biodegradable cup (63% and 37% respectively). Overall, these findings are consistent with literature demonstrating that a monetary nudge coupled with a social nudge are effective to encourage behavioural change.<sup>2</sup>

Based on our findings, we propose that The Grind implement a loyalty card where customers receive a free beverage after purchasing 10 beverages in a reusable cup to nudge sustainable behaviour focused on reuse. Additionally, we suggest the removal of coffee cup lids to reduce the unnecessary waste of single-use plastics. Lastly, as a next step, we suggest that The Grind offer their own in-house china that dine-in customers can use to minimize their waste production.

## Collaborators

We would like to give special thanks to our collaborators: Alexandrea Johnston, our Community Project Champion and the Vice President of Finance at the MSU; our SUSTAIN 3S03 instructional team, Kate Whalen, Eric Howarth, Gabrielle Gonsalves; Zero Waste McMaster, for their efforts in promoting the Greening the Grind Project; and Connor MacLean the Communications Officer at the MSU. Last but not least, the Greening the Grind Project could not have been completed without the help of McMaster students who participated in our survey.

# Compostable Containers and Cutlery

## Student Authors

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## Community Project Champions

**Liana Bontempo**, Hospitality Services



Example of biodegradable utensil and plate.  
Photo Credit: Plastic Action Centre

## Overview

The consequences of single use plastics have reached epidemic proportions. According to a UN Environment report, only 9% of global plastics produced are actively being recycled.<sup>1</sup> McMaster Hospitality Services has made impressive strides to reduce waste, which are reflected in the implementation of compostable cutlery and food containers. However, student education and awareness

are integral to this program's success. Due to the number of food vendors and the high foot traffic, MUSC is one of the largest producers of waste on campus<sup>2</sup>. These factors are why we have selected MUSC as our model for campus. The goal of our project is to increase composting on campus through education and awareness.

## Objectives

1. Establish a baseline for student composting behaviour on campus.
2. Identify the most efficient communication strategy to reach the McMaster community.
3. Share our findings and recommend next steps.

## Reporting

The baseline rate of composting was compiled from 10 hours of observational data. It demonstrated that during peak meal times in MUSC, the compost was used 2.15 times per half hour on average. For comparison, the adjacent recycling and trash containers were used on average 22.8 times. Feedback surveys indicated that students believed posters would serve as the most efficient way to communicate with them about composting practices on campus. Following this feedback, we collaborated with the departments of Hospitality Services and MUSC Administration to implement composting education posters on the compost bins in MUSC. The posters helped to identify the compost bins, which were previously unmarked, and inform the public that the containers and cutlery were compostable. After implementing this strategy, our team observed an 11% increase in composting behaviour. Now, individuals who go to the waste-sorting area are 8.2% more likely to use the compost than they were prior to our project.

## Collaborators

We would like to extend sincerest thanks to our Project Champion, the Wellness and Sustainability Manager at the Hospitality Services, Liana Bontempo, who has offered us guidance and support throughout this process. Thank you to Nick Giammarco from Hospitality Services who designed the implemented posters. We would also like to thank the Academic Sustainability Programs Office and the teaching staff of the course for giving us the opportunity to positively impact our community and offering their feedback so that we may do so to the best of our abilities. We would also like to thank students who provided us with feedback as well as the Hospitality Services staff and Facility Services staff for their support.

# Sustainable Enhancement of the Essential Utensils Kit

## Student Authors

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**Eric Andreacchio**, Commerce  
**Arvin Sekhon**, Social Sciences

## Community Project Champions

**Sabrina Dasouki**, Essential Utensils  
**Diane Warwick**, McMaster Campus Store



Pictured is the final pilot design of the Essential Utensils Kit that is being sold in the Campus Store.

Photo credit: Sabrina Dasouki

## Overview

In 2018, Canadians disposed over 15 billion single-use plastic items, generating 3 million tonnes of plastic waste.<sup>1</sup> In 2018, a group of SUSTAIN 3S03 students tackled the problem of single-use plastics at McMaster, aiming to inspire a positive and sustainable behaviour change. They designed and produced the “Essential Utensils Kit” - a compact kit that includes reusable utensils and a reusable napkin, all contained in hand-sewn Eco-Felt material.

While created as a pilot, the business has received interest by consumers and distributors alike. Sabrina Dasouki, Founder of Essential Utensils, chose to pursue the project as a business that encourages sustainable habits in the McMaster community. To contribute to the next phase of mass sale and distribution of the kits, the goal of our project was to help sell the kits on campus, resulting in less plastic waste and a healthy behaviour change away from single-use plastics.

## Objectives

1. Establish the Kit’s brand identity by adding a logoed label
2. Introduce the Kit to the McMaster community by creating informational material
3. Advertise the kits for sale to a relevant audience

## Reporting

To satisfy our first objective, a local printing and embroidery business was contacted and provided logoed patches, which were stitched to the front of the kits for easy identification. On November 15<sup>th</sup>, 105 patches were delivered to be attached to the kits.

Continuing, to satisfy our second objective, a biography of the business was created as an informational hand-out/poster that was displayed at the Campus Store. The biography allows consumers to learn about the history of the Kit, its development, and its purpose of promoting sustainability on campus. The biography was printed locally and displayed at the Essential Utensils booth during two McMaster event exhibitions.

Sustainability Day on October 23<sup>rd</sup> and Engineers Without Borders on November 11<sup>th</sup> were the two events at which Essential Utensils was showcased. At these events, the Kit gained more notice, interest, and feedback from attendees. A survey about the Kit was presented to these attendees and yielded 33 responses. The survey investigated preferences regarding cost, components, and customizability. Many attendees were eager for more information and to get their hands on a kit for themselves.

Finally, on November 19<sup>th</sup>, 10 kits were introduced to the Campus Store and were sold out by December 3<sup>rd</sup>. Owners of the kit are actively reducing their consumption of single-use plastics, thereby achieving the ultimate goal of our project and the Essential Utensils Kit.

## Collaborators

We would like to give special thanks to our Community Project Champions, Sabrina Dasouki, Founder of the Essential Utensils Kit, and Diane Warwick, Merchandise Manager at the McMaster Campus Store. We would like to thank Cowhide Promotional Wear Inc. for working with us to provide the patches. Also, we would like to thank Kate Whalen, Eric Howarth, and Gabrielle Gonsalves, our SUSTAIN 3S03 instructional team members, for their mentorship and support. Last but not least, we want to thank everyone who supported the Essential Utensils Kit through its developed and continued growth.

# Eliminating Single-use Plastic Bags at the McMaster Campus Store

## Student Authors

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**Atiya Iqbal**, Health Sciences

## Community Project Champions

**Louise Walker**, McMaster Campus Store

**Tyler Mah**, McMaster Campus Store



Plastic bag portrayed as an iceberg representing the effects of single-use plastics in the environment

Photo credit: iStock by Getty Images

## Overview

Plastic pollution is currently a global issue and single-use items like plastic bags significantly contribute to this problem. Approximately 15 billion plastic bags are used in Canada every year, yet only 10% are recycled.<sup>1</sup> As a response to plastic pollution, the McMaster Campus Store has eliminated the distribution of single-use plastic bags and is instead encouraging people to bring their own bag.<sup>2</sup> Research on plastic bag alternatives emphasizes that all bags have an impact and that the

best option is to use a bag as many times as possible to avoid unnecessary consumption.<sup>3</sup> Although the Campus Store is encouraging customers to bring their own bag or reuse a donated plastic bag, the Store still sells reusable tote bags, as a last resort. The goal of our project was to support the Campus Store in promoting and encouraging the desired behaviour signaled by their message to, "Bring Your Own Bag".<sup>4</sup>

## Objectives

1. Educate about the pros and cons of various types of bags
2. Increase the online presence of the "Bring Your Own Bag" initiative
3. Report on the impact of the initiative, based on customer behaviour

## Reporting

To accomplish our first objective, we collaborated with fourth-year Life Sciences student, Gabrielle Gonsalves, to create an infographic and list of Frequently Asked Questions (FAQs). The infographic highlights the pros and cons of common bag types and FAQs respond to common questions about the initiative. Both the infographic and FAQs are hosted on the Campus Store's 'Green Initiatives' webpage, which highlights the "Bring Your Own Bag" initiative as well as our project.

To achieve our second objective, we developed five Instagram posts featuring McMaster students using reusable bags at the Campus Store. The posts were shared on the Campus Store's Instagram page in conjunction with a prize giveaway aimed to increase initiative awareness and participation. Although we engaged over 2000 people\* on Instagram, our group recognized that determining success of our third objective required behavioural change, which occurs gradually over time.

As such, we worked with the Campus Store to track the number of tote bag purchases per total customer transactions each week. Since the Campus Store eliminated the sale of single-use plastic bags in August of 2019, the percentage of consumers who purchased their reusable bags decreased from 10.6% in September to 7.9% in November, signaling positive momentum of this initiative.

## Collaborators

Our team would like to extend sincere thanks to our Community Project Champions, Louise Walker and Tyler Mah from the McMaster Campus Store, as well as our Project Mentor, Gabrielle Gonsalves, for all of their support, encouragement, and direction throughout the duration of our project. We would also like to extend our gratitude to Kate Whalen from the Academic Sustainability Programs Office, our student Instagram models, and all of the individuals who liked and shared our posts -- your contributions were instrumental to the success of our project.

\*Total number of likes among five posts as of December 2, 2019 within a two week period





# Trash to Treasure: A Process for IT Collection, Reuse, and Donation

## Student Authors

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## Community Project Champions

**Craig MacDonald**, Facility Services  
**Richard Godsmark**, University Technology Services  
**Ryan Johnson**, SLSH greenBYTE



McMaster students at the IT donation event  
Photo credit: Jessica Radko

## Overview

From McMaster University alone, it is estimated that more than 2,000 computers are sent for recycling each year, but many of them could still have a long useful life.<sup>1</sup> The aim of the Trash to Treasure project was to reduce IT waste\* and donate refurbished electronics within the local community. Working alongside McMaster's Facility Services; University Technology Services (UTS); our collaborating

SUSTAIN 3S03 student team (see p. 16); and SLSH greenBYTE, a local social enterprise, we re-envisioned the lifecycle of IT waste at McMaster, with a focus on reuse. Specifically, our group's goal was to support adoption and long-term sustainability of the initiative at McMaster through optimizing the process for collecting, sanitizing, refurbishing, and donating computers and other electronics for reuse.

## Objectives

1. Implement a process for quick and easy computer donation by faculty and staff
2. Create a process that instills trust and integrity with respect to data security
3. Shift the focus from IT *recycling*, by creating multiple avenues for IT *reuse*

## Reporting

Through working with our campus collaborators, we successfully implemented a convenient and process for upcycling electronic devices on campus. Our team implemented a short and easily accessible online form available through McMaster's Facility Services website, which enables staff members to request pickup of IT equipment from their office location. While the form is quick and easy, it also ensures that any data located on the collected devices remains securely with a University representative. The next step in the process involves hard drive removal and delivery to UTS for sanitization. Furthermore, to ensure the hard drives can be replaced in their original device, we designed a sticker system to keep track of hard drive and computer pairs. This process has already proven to foster trust amongst staff, demonstrated by feedback and the large number of donations received.

To provide multiple opportunities for reuse, we hosted a campus-wide IT collection event on November 13<sup>th</sup>, where we received more than 100 pieces of IT equipment. After sorting the equipment by its level of quality and potential for reuse in the community\*\*, we recognized that there was also a market for reuse by McMaster students. Thus, we hosted a donation event on November 28<sup>th</sup>, where over 200 students upcycled nearly all devices available within 30 minutes. Students expressed interest in the devices for standard operation, exploration, and creative projects.

Resulting from these various processes, over 70 devices were collected and donated to greenBYTE for distribution to local kids in need, and 150 were reused by McMaster students, which ultimately diverted over 1000kg of IT equipment from the recycling stream through shifting our focus towards reuse.

## Collaborators

We would all like to thank our Community Project Champions, Richard Godsmark, Ryan Johnson, and Craig MacDonald, for their thorough mentorship and tremendous support during our joint project. We would also like to thank Kate Whalen, Alexander Schaap, Melissa Cusack, Thomas Siuda, Joanna Zuk, Abbie Little, Grace Kuang, Reta Meng, Jessica Radko, Agnes Konopka, Carlos Figueira, Susan Millman, Adam Chiaravalle, Famke Alberts, Linda Jaskiewicz, Sue Mckinlay, and all of the Facility Services and UTS staff members who supported this initiative. Last, but not least, we want to thank all of the staff, faculty, and students who helped to promote and participated in the Trash to Treasure initiative. With the unflinching aid of these incredible individuals we were enabled to bring our ideas of a sustainable community into reality, here at McMaster University.

\*Devices that are no longer serving University operations, but still have significant potential within local communities

\*\*greenBYTE maintains a rigorous standard for devices donated within the community. Those offering a shorter lifespan are still valuable to McMaster students.



# IT Collection, Reuse, and Donation: Communication and Engagement

## Student Authors

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**Claire Logeais**, Engineering Exchange Student

**Shunmathi Shanmugam**, Arts & Science

## Community Project Champions

**Craig MacDonald**, Facility Services

**Richard Godsmark**, University Technology Services

**Ryan Johnson**, SLSH greenBYTE

## Overview

In 2016, Canada produced an estimated 725,000 tonnes of electronic waste.<sup>1</sup> At McMaster University, IT waste is either recycled or reused through semi-annual events hosted by Facility Services.<sup>2</sup> McMaster University and social enterprise SLSH greenBYTE were exploring opportunities to work collaboratively to reduce University IT waste\* and donate refurbished electronics within the local community.<sup>3</sup> Working in tandem with our collaborating 3S03 team (see p. 15), the overarching goal of our

## Objectives

1. Engage staff and understand their attitudes and perceptions towards IT reuse and donation
2. Generate support and participation from staff, faculty, and students
3. Disseminate the collection and donation results to the McMaster and broader community

## Reporting

We began our project by engaging McMaster staff, and we learned about opportunities, barriers, and potential concerns towards IT reuse and donation. Working with the Process team members, we were able to apply staff member feedback in both the design and communication of our pilot program. With respect to communication, our team created a webpage on the Facility Services' website, which included a FAQ section.

With the pilot program developed and our communication strategy in place, we established our goal to collect at least 100 computers within a three-week period for community reuse and donation. We sent mass emails to the campus community; published a story on the McMaster Daily News; sought support from various ambassadors across campus through Technology Roundtable meetings and Sustainability Day; and co-hosted an IT collection event. At the event, we engaged in dialogue with attendees and did a takeover of the University's Instagram. Through these efforts, 50 computer systems were collected within two weeks of our first mass email, our article was the most read Daily News article published that week, our collection event saw over 50 attendees, and our Instagram takeover generated an overwhelming positive response.

We concluded our project with a press release highlighting the collaborative efforts that led to over 70 computers being donated to greenBYTE for distribution to local kids. Through our experience, we learned first-hand about the complexity of sustainability challenges, the importance of collaboration when creating sustainable solutions, and what is meant by the proverb, "If you want to go fast, go alone. If you want to go far, go together".

## Collaborators

We would like to thank all of our collaborators which we have jointly recognized on page 15.

\*Devices that are no longer serving University standards, but still have significant potential for reuse within local communities.



From left: Shunmathi Shanmugam, Mehran Janatyani, and Claire Logeais. 3S03 students from the Communications team on IT Waste Collection Day. Photo credit: Grace Kuang

joint project was to establish and implement best practices, with respect to both community engagement and operational process, for university IT reuse that enhances the lives of underserved members of the local community. Specifically, our team focused on community engagement and strategic communication that would encourage individuals from across campus to donate their unwanted IT equipment and support youth in our community.

# Community Permaculture Lab

## Student Authors

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**Clara Myhrman Nilsson**, Engineering

## Community Project Champions

**Adrian Hodgson**, Design Process Facilitator CPL  
**Brody Meyer**, Project Coordinator CPL  
**Cynthia Myer**, Permaculture Project Champion CPL



Sample ring-book page, laser-printed on wood  
 Photo credit: Teagan Konig-Hession

## Overview

Modern food production is one of the major contributors to environmental degradation and to the current climate change crisis.<sup>1</sup> As such, it is necessary to transition to a more sustainable means of food production. Permaculture is a sustainable solution to food production as it absorbs more carbon dioxide than it creates, unlike conventional agricultural practices.<sup>2</sup>

Specifically, permaculture design is a brand of systems design based on ecological principles and regenerative cultural practices. In working with the Community Permaculture Lab (CPL), the goal of our project was to teach a broad audience about the importance and the elegant utility of permaculture design in our world today.

## Objectives

1. Understand the importance of specific plants and their relation to permaculture design
2. Compile the information in a comprehensive and systematic way
3. Disseminate the information in a user-friendly and accessible format

## Reporting

To achieve our first objective, we received a list of six primary plant species that are integral to the CPL, as well as an additional list of 14 plants, which each support one of the primary plants listed. We consulted academic literature and obtained first-hand knowledge from members of the CPL to gain a deep and fulsome understanding of each plant on the list, their relation to each other, and their importance to permaculture design.

We compiled and organized our information of the primary plants by their location in the CPL, each followed by their respective supporting plants. We described each of the 20 plants based on their connection to the 12 principles of permaculture design<sup>3</sup>, as well as the justification for inclusion in the CPL.

To ensure easy access to the compiled information, we created a well-designed electronic report that can be published and shared online and could also be produced in hard copy. In our own attempt to apply our understanding of permaculture design and how it could be applied to create a hard-copy children's book or reference guide, we created a small (5" x 3.5") laser-printed, wood, ring-book (see image). By leveraging the laser printer from McMaster's Thode Makerspace and printing on sustainably sourced, Canadian wood, such as cedar, this method could be used to build upon our project in the future collaborations with the CPL.

## Collaborators

We would like to thank our Community Project Champions: Adrian Hodgson, Brody Meyer, and Cynthia Myer, as well as the engaged members of the CPL. The continuous guidance, support, and education we received from them provided a solid foundation to help us achieve our goals. We would like to thank the members of the SUSTAIN 3S03 instructional team: Eric Howarth, Gabrielle Gonsalves, and Kate Whalen for their unending support and help throughout the creation process of this project. Last but not least, we would like to thank the staff members of the Thode Makers Space for their patience and tremendous support in creating our pilot ring-book.



# Sustainability Day Tree Planting and Student Education

## Student Authors

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**Mubariz Maqsood**, Science

**Karan Taghizadeh**, Science

## Community Project Champions

**Martha Killian**, Nature at McMaster

**Wayne Terryberry**, Nature at McMaster

**Abbie Little**, Academic Sustainability Programs Office



Student volunteers planting trees at 10 Acre Field  
Photo credit: Anna Verdillo

## Overview

In today's state of environmental emergency, trees are a source of sustenance, acting as biological filters, storing carbon, and harbouring wildlife.<sup>1</sup> Climate change and soil erosion are a few of the many issues being exasperated through the permanent removal of trees. Annually, this removal amounts to the cutting of 15 billion trees through deforestation, forest management practices, and land use changes.<sup>2</sup> Locally, this removal, especially of native tree species, disrupts ecosystem balance and the ability of native organisms to survive. Planting native trees promotes the

rehabilitation of local areas and re-establishment of homeostasis.<sup>3</sup> Experiential learning-based activities, including tree-planting, can establish positive attitudes towards the environment, thereby sustaining long-term conservation efforts.<sup>4</sup> The goals of this project were to address the issue of tree decline directly by involving the Hamilton community in rehabilitation practices like tree-planting, and to sustain such efforts by educating individuals on the importance of long-term sustainability.

## Objectives

1. Engage the Hamilton community through multiple tree-planting events
2. Develop a media campaign to increase public awareness of environmental sustainability
3. Educate individuals on the importance of trees, environmental health, and sustainable practices
4. Support continuity of tree-planting events through the creation of a transition package

## Reporting

Working alongside local non-profit, Trees for Hamilton, we organized two educational tree-planting events at McMaster. Prior to the events, a media campaign was launched to educate individuals on the importance of sustainable practices and simultaneously promote the event. During the first drop-in tree-planting event, 40 volunteers learned proper planting techniques and helped to plant 125 native trees. The second tree-planting event brought together 60 volunteers from the community, environmental organizations, and media outlets. Volunteers planted 115 native trees, removed over 100 invasive species, and learned about the importance of rehabilitation throughout the process. Results of a post-event survey\* showcased that participants enjoyed tree-planting the most (80%), compared to those (20%) who preferred native species removal. Furthermore, 90% of survey participants said they would recommend this event to a friend, demonstrating the value of continuing the event in future years. To ensure continuity of this initiative, we created a transition package consisting of marketing resources, research, proposed timelines, graphic packs, and a personal video conveying our lessons learned. We hope that future groups can use our transition package to build upon our work and enhance the event in years to come.

## Collaborators

We would like to give special thanks to our Community Project Champions: Martha Killian, Abbie Little, and Wayne Terryberry from McMaster University for their logistical support and guidance in helping us organize our tree-planting events. We would also like to thank Eric Howarth and Gabrielle Gonsalves, our course Teaching Assistants and mentors, for providing insight and sharing their past experiences in regards to this project. We would also like to extend appreciation to Myles Sergeant from Trees for Hamilton for his guidance, funding, and promotion of the events. Finally, we would like to thank the community members and volunteers who attended and supported the tree-planting events.

\*75 survey participants

# The Solitary Bee Project

## Student Authors

**Kevin Mattes**, Engineering  
**Robert Sager**, Science  
**Isaac Yeung**, Science

## Community Project Champions

**Craig MacDonald**, Facility Services



SUSTAIN 3S03 students in front of McMaster solitary bee homes. From left: Kevin Mattes, Robert Sager, and Isaac Yeung. Photo credit: Kevin Mattes

## Overview

With the rise of pesticides, parasites, disease, and habitat loss, the world is seeing a rapid decline in one of nature's most important pollinators, solitary bees.<sup>1</sup> In 2018, high school student and Founder of The Solitary Bee Project, Simran Jolly, established her social enterprise with the mission to increase the population of endangered pollinator species. She began working with local governments and universities to place bee homes in green spaces.

As part of 100in1Day Hamilton, The Solitary Bee Project and McMaster co-hosted a workshop to construct 50 bee homes from various up-cycled materials and placed them throughout campus. In an effort to continue this work, the goals of our project were to enhance the bee home design and educate the public about the importance of solitary bees.

## Objectives

1. Understand which materials, locations, and design components are most effective
2. Share our findings and recommendations publicly
3. Educate about the importance of solitary bees and this broader initiative



A solitary bee visiting one of McMaster's bee homes. Photo credit: Kevin Mattes

## Reporting

With the help of McMaster's Facility Services, we surveyed all 50 bee homes on campus and evaluated them based on the degree to which solitary bees nested in each. When surveying the bee homes, we found evidence that the homes with bamboo had the most activity. Houses with mixed fillings and paper had much less activity, and cork and sticks had none. A general trend we noticed was that bee homes closer to Cootes Paradise were more active than those surrounded by artificial structures and away from natural forestry. With the help of Luc Peters from Humble Bee, we created a list of the tree and plant species solitary bees need to thrive. Tree species such as Basswood, Honey Locust, and Crabapple are native and can be easily introduced to Cootes Paradise and around campus.

With the help of Craig MacDonald, from McMaster's Facility Services, we created and installed five educational plaques, which highlight the importance of solitary bees and bee homes and acknowledge the various collaborators who contributed to this initiative.

## Collaborators

We would like to thank our Community Project Champion, Craig MacDonald, Director of Maintenance Services; Abbie Little, Community Relations Coordinator, Academic Sustainability Programs Office; and the SUSTAIN 3S03 instructional team for their guidance and support throughout the entirety of the project. We would also like to thank McMaster Facility Services for their aid in accessing the bee homes and Luc from Humble Bee for advising us about bees and tree species. Last, but not least, this project could not have been possible without the volunteers from 100in1Day Hamilton 2019 intervention, and we thank them for their integral support in creating the inaugural bee homes.

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