Working Towards a Greener Future:
Worcester Go Green Week Preparation- Fall 2017

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Submitted To:
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Authorship:

Our team completed this project report using a team approach, with each member contributing equally in both writing and editing. As a result of this approach, no sections contained herein have any single member as a principle author, but were instead done collectively. This report was therefore authored equally in all aspects by the three members of the Go Green Week team: Stephen Burke, Adam Camilli, and Max Marks.

Abstract:

The City of Worcester, UK is prioritizing community engagement in its efforts to become more sustainable. We improved the current platform for the Go Green Week Fair held by the University of Worcester to promote sustainable habits. We created a survey instrument to evaluate its impact, and recruited several local businesses to sponsor the upcoming 2018 Go Green Week. Through our collaboration with the University of Worcester, we have assisted the city of Worcester in engaging their community on sustainability.

Executive Summary:

The city of Worcester, UK seeks to become more sustainable by working with its citizens to help them reduce environmental impact in their day-to-day lives. In order to strive for a future that conserves their environment and protects public health, the city aims to primarily work with the Worcester population to become sustainable. It expresses this in its current mission statement: "The city's sustainability focus now is to conserve our environment by working collaboratively and helping local residents to reduce their impact on the environment." (Worcester City Council, n.d.) The city council has listed three key objectives on their website. These are designed to engage the local community on how they can become more sustainable:

- To increase community awareness regarding climate change;
- To expand governmental and communal initiatives to address these issues;
- To communicate more about how residents can help the environment.

With these objectives, the city hopes to make progress towards several long-term environmental harm reduction goals, notably improving air quality and conserving water resources (ibid.).

To accomplish these objectives, the city council has collaborated with the Sustainability Department of the University of Worcester to run two annual Go Green Week events. These are week-long fairs centered in the university St. John's campus in February and High Street in the city center in April. The winter Go Green Week is targeted towards the students and staff of the university campus, and the spring Go Green Week is targeted towards the general population of Worcester. Worcester City Council, Worcestershire County Council, Worcester BID, and Heart of Worcestershire College are the main sponsors of the Worcester Go Green Weeks. They are each run by students and staff of the University of Worcester. American students from Worcester Polytechnic Institute in Worcester, Massachusetts provide additional help to prepare and carry out the April Go Green Week. The ultimate goal of these events is to improve the systemic sustainability of the city of Worcester by educating its citizens.

To assist the city of Worcester in reaching this goal, our project had two key deliverables. First, to help prepare for the upcoming 2018 Go Green Week, we assembled a

list containing contact information of several local businesses owners who expressed interest in the event. By doing this in November, we were able to recruit businesses more easily than groups in past responsible for running Go Green Week in April were able to. We explained to the businesses that they would be asked to either provide resources to or participate in the event in exchange for being featured on a Google Maps tour of Worcester we created, which showcases local businesses supportive of sustainability.

Our second deliverable was a survey instrument to assess the awareness and interest of the general population of Worcester on how they can be sustainable. Our intention was to provide a mechanism for future Go Green Week teams to evaluate the impact of the event from year to year. We worked extensively with our sponsor liaison Katy Boom, as well as her assistant director Matt Smith and Worcester government representative Warwick Neale, to design the survey. We based it on two surveys conducted earlier in previous Go Green Weeks, making adjustments to condense the number of questions and target them towards the Worcester population in general, instead of at university students and staff. This is meant to improve local sustainable development. This goal has been addressed through the completion of the following objectives and deliverables:

Objectives:

1. Launch the survey in the Worcester community, while attempting to best represent the Worcester's population in the data collected by having a set of participants that cover all demographics of the community as best as possible.
2. Quantify collected data through BOS (Bristol Online Survey tool) and draw conclusions on the data by itself, as well as through cross-tabulation with prior data collection of the previous spring Go Green Week group.
3. Gain endorsement, sponsorship, and support from local businesses by approaching them, and encouraging participation in Go Green Week taking place next spring.
4. Formulate two sets of recommendations for future Go Green Week project groups: one set of recommendations for the future spring groups, and a second set for the future fall groups.

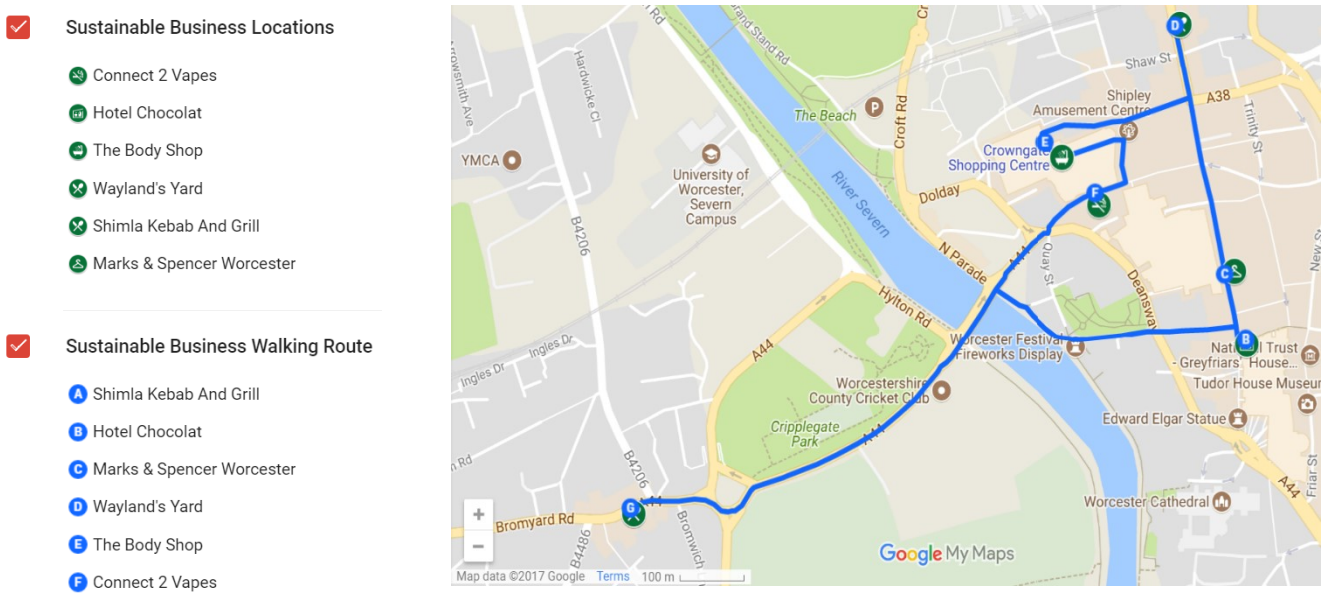
Deliverables:

1. Design a survey instrument, in accordance with our sponsors' recommendation to build upon the previous staff and student surveys The new survey meets the need to be street-participant friendly, meaning an average completion time of less than five minutes by Worcester citizens. Validation of the new survey isn't given until piloting results of the survey has sponsor approval.
2. Design a Google Maps route that promotes local businesses agreeing to contribute towards the Go Green Week event for the following spring.

In the course of our project, we first conducted a meeting with our project stakeholders to get a general idea of the resources available to us to accomplish our objectives. We discovered some of the more pressing environmental concerns facing Worcester, which included but were not limited to litter and the prevalence of gulls feeding off of litter around the city center. One of the biggest problems associated with the litter was the risk of infants, domestic pets, and birds eating plastic and paper litter such as small wrappers and cigarette butts (Novonty, 2011). The gulls were considered pests, who had been known to intrude people's space, especially when eating, as well as attack pets and rip open trash bags causing more litter (Horwood, 2015). Because of this, the Worcester City Council has made litter and the presence of gulls primary environmental issues for the city to address.

Throughout October and November, we learned how our sponsors wished us to design the survey, and worked with them to create it. In particular, we were told to use questions from surveys used to evaluate the impact of the last university Go Green Week event. There were two of these surveys, one meant for university students, and another for university staff. Once we finalized the survey, we disseminated it in three major locations: The St. John's district, the Hive, and High Street. We picked these locations because each was frequented by varying demographics that we wanted to survey. These included but were not limited to the elderly at the Hive, students and young parents in the St. John's area, and a fairly randomized population in the High St. district. Additionally, after surveying, we approached various businesses that we had emailed the day before to ask them if they would

like to be a sponsor of Go Green Week in exchange for being featured on a Google Maps route (pictured below).



During the last two weeks of our project, we analyzed the data from the survey mainly by cross-tabulating responses to demographics questions with questions on sustainability. From this analysis we were able to come up with several findings related to the age, gender, and education level of our respondents. We determined several recommendations for topics that should be focused on for the upcoming Go Green Week. Additionally, we enlisted seven businesses around Worcester to act as sponsors for the event and provide resources such as coupons and other materials.

Upon analyzing our survey responses, we were able to come up with several findings based on comparison of subjects' responses with their demographic information:

- The results of our survey are not comparable with the results of the student and staff surveys they were based on. This was due to several insurmountable differences in the methods used to formulate and distribute them.
- Our second finding was that among the people we surveyed, women are more likely than men to practice sustainable habits.
- Our third finding was that respondents who had only a high school education or less than a high school education were less like to participate in general sustainable activities.

- Our fourth finding was that the age ranges that we selected for our participants did not generally correlate to how aware they were of sustainable practices.
- Our fifth finding was that respondents were less aware of certain sustainable technologies than others, in particular low-flow shower heads and energy saving light bulbs.
- Our sixth finding was that among participants who had programmable thermostats, the vast majority neglected to use them to save energy during the winter.

Based on our experiences in this project on designing and launching our survey, and talking to businesses, we were able to formulate the following recommendations:

- The best way to engage businesses as sponsors is to first email the store a brief explanation of Go Green Week that emphasizes they will not be asked for monetary donations or excessive use of their time. Then, come into the store prepared with a business pitch that gets the most important points across in a brief manner. Store owners need to hear something that is both quick and convincing in order to have a good chance of getting them on board.
- Stores and restaurants to which you give repeated business over the course of the project will be far more receptive to signing on. Restaurants in particular were very hard to enlist as sponsors when we had never been in them before, even if they were emailed beforehand.

Acknowledgements

We would like to thanks the following for their help, patience, and support with our group during our project:

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Worcester City Council
Worcestershire County Council
Worcester Business Improvement District
Heart of Worcestershire College
The University of Worcester

We would like to thank the following Businesses for showing interest in donating and participating in Go Green Week:

Shimla Kebab and Grille
Connect 2 Vapes
Marks and Spencer
The Body Shop
L'Occitane
Wayland's Yard

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Chapter 1: Introduction

Sustainability and conservation of the environment have become major global issues that affect communities around the world. International organizations and national governments across the globe have consequently enacted policies and initiatives to stem environmental degradation as well as the depletion of natural resources (SOAS, University of London, 2005, p.11). Within specific regions and countries, however, it is equally important that local governments and institutions take responsibility for the act of raising awareness of these matters in their own population. Promoting knowledge of sustainability and environmental issues on a local level, when combined with larger scale national and international activism, has the potential to be far more effective in ultimately preserving local ecologies and resources (Burns et al, 2015, p. 42; Sarkissian et al, 2009, p. 1). True systemic sustainability is far easier to strive for when community members are motivated to practice sustainable habits on an individual basis.

The lack of awareness of sustainability remains a problem in countless countries and regions. Local governments need to devote significant time and attention to informing their communities of how sustainability and environmental issues directly concern them. Present-day lack of sustainability is rooted just as much in the habits of individuals as those of corporations and governments, and it remains prohibitively difficult to change peoples' behavior if they are not sufficiently informed about them (Iizuka, 2000, p.7).

The University of Worcester, located within Worcestershire County, UK, has adopted its own version of People & Planet's Go Green Week, a framework designed to educate citizens on how to incorporate sustainable habits into their everyday lives (People & Planet, 2017). The university has been running Go Green Week on its campus for seven years, and has expanded upon this event's model by partnering with the Worcester government to promote a city-sponsored Go Green Week aimed at educating the Worcester community at large. This event was first piloted in April of 2017, and reflected the increasing interest of the Worcester town government in addressing its citizens' awareness of sustainability (Worcester City Council, n.d.).

During the pilot, two key problems arose that prevented the event from achieving its full potential. The first was an issue of time, where a number of local businesses were unable

to sponsor the event due to the inability of the group running it to contact them far enough in advance. Secondly, while a survey instrument was created to evaluate the immediate impact of the event, it was not designed for continued use as an assessment tool of the effectiveness of Go Green Week. As a result, while the event ran smoothly and received positive public feedback, a significant amount of resources were missed from potential sponsors. Furthermore, the effectiveness of the event in achieving its ultimate goal was not able to be measured in a way that could be compared to future city Go Green Weeks. This was due to the fact that the surveys made previously were meant for either students or staff of the University of Worcester, and not the general public. In order to improve on the previous Go Green Week model, we needed to find a way to eliminate these two problems.

To combat the issue of having to contact businesses on short notice, our group obtained a list of businesses involved in last year's Go Green Week as well as several others, and began recruiting them in November. After giving us their approval, we recorded the business owner's personal contact information for the group responsible for running the upcoming city Go Green Week, in order to reconnect with these businesses upon arrival. This gave the businesses time to prepare for donation and/or participation in the event.

Our group also had to create a survey instrument that could be used to evaluate the effect of both the upcoming Go Green Week and future ones in educating the Worcester population. We worked with our sponsor liaison, Katy Boom, to create this new survey instrument. Per the directives of our sponsors, we mainly rearranged and reworded questions from last spring's student and staff surveys. For example, we adjusted questions relating to sustainable habits on campus to instead relate to citizens' homes. We also added a question concerned with each of the "10 Golden Rules for Living Sustainably" (see Appendix H) created by the university. Finally we simplified the wording of the questions so that any local citizen could understand them regardless of education level. This way we could measure citizens' habits in an efficient manner and be able compare results in the future to ours. We also used this survey to find out which sustainable habits are not as well known to the Worcester community. By finding which habits are not as widely practiced, we have made it easier to run an effective Go Green Week and thus help improve Worcester's sustainability overall.

In summary, the two purposes of our project were to lay the groundwork for the 2018 Go Green Week by obtaining sponsorships from local businesses, and design a survey instrument capable of assessing the impact of city Go Green Weeks on a yearly basis. The project commenced with meeting with our sponsors to gain a clear understanding of their desired goals for the survey. In working with the Sustainability Department at the University of Worcester, we designed a new and improved survey that gauged both the level of interest and awareness of Worcester citizens in how they can be sustainable. This questionnaire was made concise and simplistic to efficiently evaluate the impact of the Go Green Week event through analysis of its responses.

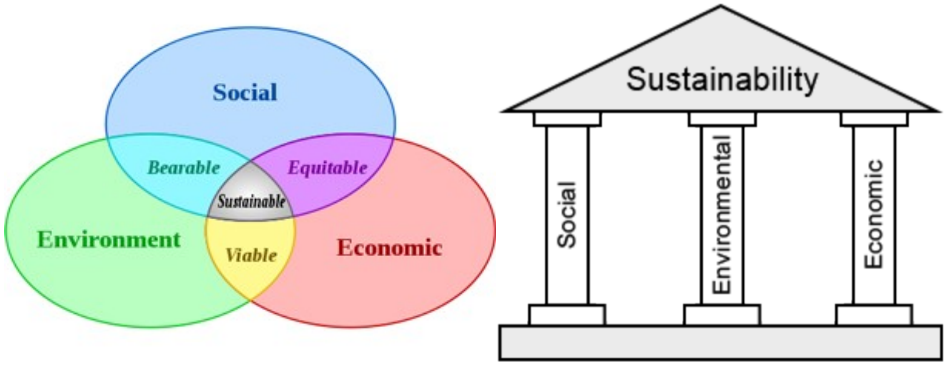
Chapter 2: Background & Literature Review

This chapter begins with an overview of sustainable development, paying special attention to the three pillars of sustainability. We examine public awareness and engagement, and how they are critical in maintaining an environmentally, economically and socially sustainable community. Establishing relationships with businesses is discussed. Finally, we begin to explain the design of our study to help evaluate the effectiveness of Go Green Week, in terms of the necessary research and knowledge that were required to enact it. Particularly, the methodology and theory behind surveying are discussed.

2.1: Sustainability

Sustainability, in the most general sense of the word, describes the ability of a system to continue some desired behavior indefinitely (Clarke, 1977, p. 363). It is of interest to society as a tool for designing more efficient systems, and this project incorporates the promotion of sustainable practices as an agenda we want to advance. The purpose of our project is ultimately to help promote sustainable development in the town of Worcester, UK by educating their citizens on a communal level. To effectively obtain an understanding of sustainable development, it is necessary to first understand three pillars of sustainability. These encapsulate much of the large body of science and research on sustainability into three "pillars", or interdependent domains which governments, companies, universities, and other community organizations must seek to balance in order to be sustainable (James et al, 2015).

The three pillars of sustainability are traditionally defined as economy, environment, and society (Cato, 2009, p. 36-37), with the idea being that each pillar cannot survive in the long term without being balanced with the others. They have emerged as the preferred guideline for most organizations concerned with sustainability. This has led to them being used as guiding principles by many sustainability-focused collectives such as the Sustainable Agriculture Initiative Platform (SAI Platform), as well as for-profit corporations such as international coffee traders (Reinecke, 2012, p. 17).



Figures 2.1 & 2.2: Two of the most common types of visual guides to the three pillars. Retrieved from thwink.org and worcester.gov.uk

The term "sustainable development" was introduced by the 1980 International Union for the Conservation of Nature (IUCN) publication *World Conservation Strategy: Living Resource Conservation for Sustainable Development.* It was posited as an alternative solution to strictly separating the developed world and natural world. Sustainable development seeks to ensure that economic development and environmental conservation can coexist as time goes on: "Development and conservation are equally necessary for our survival and the discharge of our responsibilities as trustees of natural resources for generations to come." (IUCN, 1980, p. 1) In essence, progress can only go so far with unsustainable practices, and it's part of our responsibility, when pondering developmental projects, to take into consideration whether resources are being used effectively in relation to their expenditure. The short term benefit is always easiest to see, but the habit of accounting for resource expenditure in the long term that most affects society's ability to continue to develop in the future.

Contemporary understanding of sustainable development would materialize seven years later from the definition used in the landmark Brundtland report: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (World Commission on Environment and Development, 1987, p. 41). This definition, however, has never been fully agreed upon by scholars. Kates describes the Brundtland Commission's definition as having a "creative ambiguity", which permits groups with varying interpretations to work together towards a

goal "under the sustainable development tent", but as a result of its generality, created "a veritable industry of deciphering and advocating what sustainability really means." (Kates et al, 1991, p. 9) Waas supports this view, writing that "[Sustainable Development]'s appearance should be regarded within a longstanding development debate" (Waas et al, 2011, pg. 1). The underlying motivation, however, has not changed. Rogers writes that, ultimately, the intent of sustainable development is to provide organizations not solely concerned with environmental issues, namely businesses and governments, with a way to advance their own agenda in a way that does not hurt the environment: "Creating separately existing environmental institutions is not enough… [Environmental issues] are crucial to economic considerations and social policies" (Rogers, 2008, p. 9).

This project is chiefly concerned with sustainable development as it pertains to cities. James writes that "cities have become unlikely but crucial zones for the survivability of humanity" (2015, xii), a view he shares with the UN, who in the aforementioned Brundtland report devote a section to "The Urban Challenge" (World Commission on Environment and Development, 1987, 22). This section has much to say about the differing challenges faced by developed countries as opposed to developing ones. For more first-world and established cities, it opines that the problems underlying sustainable urban development are about motivation and understanding of the issue of sustainability, rather than lack of education or infrastructure to address it:

> Many cities in industrial countries also face problems - deteriorating infrastructure, environmental degradation, inner-city decay, and neighbourhood collapse. But with the means and resources to tackle this decline, the issue for most industrial countries is ultimately one of political and social choice." (ibid)

This sentiment is echoed by Couret's *Sustainability in Developing and Developed Countries* in terms of the three pillars. Couret describes how developed countries such as the US and EU members should be focusing mostly on environmental issues, since their economic and social needs are generally less pressing than those of developing nations. (Couret, 2008, p. 1)

The importance of encouraging sustainable development within leading industrial nations has been readily apparent throughout the 21st century: In 2015 over 53% of the

world's carbon dioxide emissions in 2015 originated from China, the United States, and EU countries, and in 2016 the US and EU ranked 1 and 2 respectively in use of petroleum, consuming between them more than the next 12 countries combined. Changing these trends, however, is not a simple task with any one solution. Kates describes some of the common obstacles preventing large-scale sustainable development:

> Sustainable development ... requires the participation of diverse stakeholders and perspectives, with the ideal of reconciling different and sometimes opposing values and goals toward a new synthesis and subsequent coordination of mutual action to achieve multiple values simultaneously and even synergistically. As real-world experience has shown, however, achieving agreement on sustainability v alues, goals, and actions is often difficult and painful work, as different stakeh older values are forced to the surface, compared and contrasted, criticized and debated. (Kates, 2005, p. 12)

Achieving systemic sustainability in any large organization such as a city is therefore an exceptionally challenging problem. It requires time and more importantly sustained support from local communities. Sarkissian writes that community-based initiatives are "not just helpful, but essential for sustainability" (Sarkissian et al, 2009, p. XIII-XIV). She further develops this position to state that sustainability, in fact, will only become established in communities that desire it:

> Sustainability comes from community values - it doesn't come from the professions or from business or from government strategies that are big on rhetoric but small on implementation. It only comes when the glue of community values makes it clear this is what they want. (ibid.)

In summary, sustainable development is best understood as development in which the three pillars of economy, environment and society are balanced. It has practical applications within many scientific disciplines as well as business and government, and must be considered in order to ensure advancements made in the present do not compromise humanity's abilities to make further advancements in the future (World Commission on Environment and Development, 1987). In first-world countries such as the US and countries in the European Union, governments are more likely to have the resources to balance the environmental pillar and be able to practice consistent sustainable development. The

problem in developed countries is more likely to be a lack of political and social motivation to be sustainable. This must be addressed on a local level by ensuring communities are sufficiently educated about sustainability and why they as individuals are affected by larger environmental issues.

2.2: Community Engagement

It is essential to ensure the average citizen understands and cares about sustainability. Legislative and industrial reform will be slow to come, even with sufficient resources, if there is not an impetus within a community to balance social and economic issues with environmental ones. The Brundtland report summarizes this phenomenon: "The law alone cannot enforce the common interest. It principally needs community knowledge and support, which entails greater public participation in the decisions that affect the environment." (World Commission on Environment and Development, 1987, p. 56-57) Further research suggests that perhaps the best strategy to achieve this is to synchronize the goals of sustainable development and reform with the personal needs and desires of a population, as knowledge alone does not provide sufficient motivation (Fischer et al., 2012, p. 153-155).

The question of how best to engage people on environmental issues remains an ongoing debate. As research on sustainable development progressed, the field of environmental education split into two perspectives: "[Those] that emphasize teaching of scientific facts" and "those that seek to more actively link environmental and social issues" (Blum, 2012, p. 11). The justification for focusing more on teaching science, according to Blum, is essentially "the idea that when individuals are taught about [ecological and biological] issues, they will learn to love - and therefore be inspired to protect - the natural world from destruction." (ibid., p. 12) The reasoning behind more socially inspired teaching claims that environmental issues "cannot be studied in isolation", and must be tied to more immediately relevant humanitarian and economic issues (ibid., p. 13).

While Blum is ambivalent about the relative worth of each approach, other researchers have favored a more incentive-based social approach, especially when it comes to engaging the general public. Fischer argues that the problem is a lack of motivation, concluding:

> "The global sustainability deficit is not primarily the result of a lack of academic knowledge. Rather, unsustainable behaviors result from a vicious cycle, where traditional market and state institutions reinforce disincentives for more sustainable behaviors while, at the same time, the institutions of civil society lack momentum to effectively promote fundamental reforms of those institutions. Achieving more sustainable behaviors requires this cycle to be broken." (Fischer, 2012)

Fischer further categorizes the actions governments can take towards sustainability in which the ultimate effectiveness of the action is inversely proportional to the time and effort required to implement it:

Figure 2.3: Fischer's pyramid of priorities for social change. Retrieved from jstor.org

Notably, Fischer derides legal action and specific regulations to enforce sustainability as band-aid solutions, particularly when they are "forced to fit into institutional arrangements, even when these undermine sustainability" (ibid., p. 157) Fischer claims that "profound" solutions, which directly address personal and communal values, are ultimately necessary for human behavior to become sustainable.

In terms of incentive, Too and Bajracharya of the journal *Emerald Insight* note an overall trend that consumers purchase "green" products and adopt "green" habits when they become the most convenient option available: "Consumer value positioning is vital to the

success of green products/services, i.e. understanding what consumers value and positioning the product/service to address these needs" (Too and Bajracharya, 2015, p.61). In a summary of their research, they tie overall community engagement in sustainability to six main principles, of which notably only one concerns actual knowledge of the topic (ibid., p. 63):

1. Psychological ("knowledge & values concerning environment")
2. Physical ("availability of green facilities and projects")
3. Personal ("time availability, performance requirements")
4. Public Perception ("social norms [regarding sustainable habits and practices]")
5. Price ("cost of choosing/going green")
6. Policies ("regulatory & management support")
7.

A community that has a noticeable commitment to these principles will not only have citizens more likely to practice sustainable habits, but will be able to advance their sustainability in several important ways. For example, in a government whose officials are democratically elected, policymakers will naturally tend to care about the same issues as their constituents, and if sustainability is among these, it is more likely that legislature supportive to sustainability initiatives is passed (Ji, 2016, p. 1-5).

2.3: Developing Business Relationships

Local businesses, as well as global corporations seeking to establish a local presence will be far more inclined to emphasize their own commitment to sustainability if there is significant local pressure to do so. Reduced profits and stock drops due to a perception as not being environmentally friendly are especially effective in motivating this. (Heyes et al., 2012, p. 430) If a community strongly cares about sustainability, this can lead to reduced foot traffic in stores and restaurants not perceived as environmentally friendly. Particularly for smaller local businesses, this can cause changes in their behavior (ibid.) and cause them to become more sustainable in order to improve their image. While these actions are ultimately concerned with increasing profit, they also effectively balance environmental and social issues with economic ones. The public expressing a commitment to sustainability

through their shopping habit can therefore lead to businesses practicing sustainable development (ibid.).

To establish a working relationship with a business, it is first necessary to show them why such a relationship would be a strategic investment for them. For many smaller businesses, publicity is their main concern as it is the best way for their business to grow (Gardner et al, 1988). Businesses need to be offered some benefits for donating or participating because they use money and time. This ties into sustainability through the subject of corporate social responsibility, or CSR, where companies "go beyond just the legal obligations" to help communities in order to improve their reputation and hopefully their business as well (Lii et al, 2013). One of the key initiatives in CSR strategy is sponsorship of beneficial community events such as Go Green Week in order to gain publicity for the sponsoring business (ibid.). As demonstrated in figure 4, philanthropic actions motivated by lower level economic concerns are the premier goal for CSR in terms of incentivizing businesses to act sustainably:

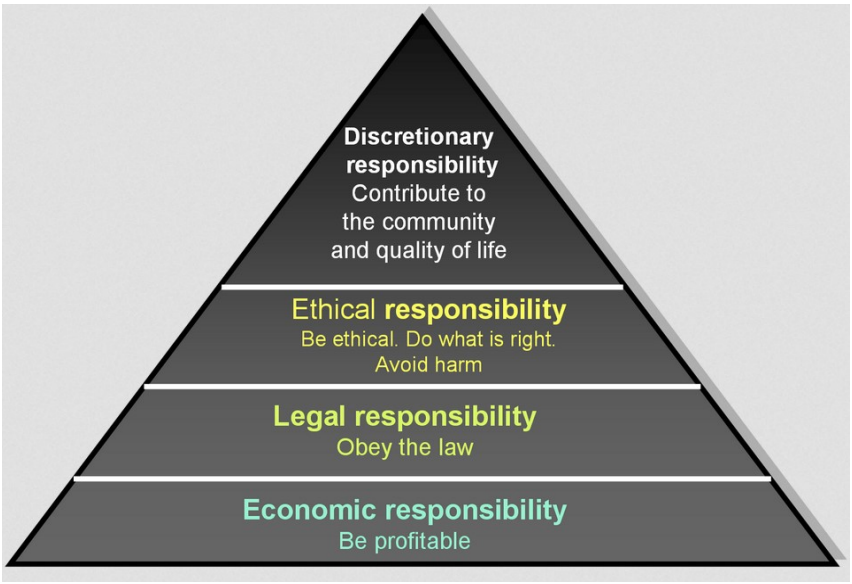


Figure 2.4: Pyramid of CSR factors. Retrieved from https://www.growyourgivings.org.

Obtaining sponsorships from businesses who are looking to bolster their image as being sustainable is especially relevant to this project. When fostering relationships in this manner, quality is better than quantity: Establishing several long-term, mutually beneficial relationship with donors tends to be more fruitful than many short-term relationships (Cajica,

2013, p. 59). Ed Lord of the non-profit DonorDrive summarizes his view of obtaining funding with the aphorism "Companies aren't looking to sponsor events, they're looking for marketing opportunities." (Lord, 2017). Cajica writes that donors simply want to verify their money is going to be utilized effectively. Either way it is clear trusting, mutually beneficial relationships with a few sponsors is best: On average, most organizations receive 80% of their funds from 20% of their total sponsors (Cajica, 2013).

2.4: Surveys

Surveys, in the field of human subject research, are questionnaires designed to provide information on a certain topic using the responses of individuals. These responses are then analyzed to generalize the results to the population represented by the respondents (Thayer-Hart, 2010, p. 1). Oppenheimer defines two broad types of surveys: Descriptive surveys, which are designed to identify trends in a population, and analytic surveys, which are designed to uncover why such trends might exist (Oppenheimer, 2000, p. 12-13). They are an established and valuable tool in studies of public perception and attitude, particularly on the environment. Iizuka claims their major use in studies is to serve as "a proxy for [the] level of environment attitude", or an approximate quantification of a population's commitment to caring about the environmental consequences of their actions (Iizuka, 2000., p. 18).

Survey results can differ based on how they are administered to subjects. The most common types of surveys given when researching a topic are questionnaires and interviews. Questionnaires are often used when trying to collect data in a conclusive and time efficient manner. This is the type of survey that we used to collecting data for our project, and how Go Green Weeks in Worcester have sought to evaluate their impact since their inception. There are several important advantages to using questionnaires in comparison to using interviews. One of the biggest advantages of using questionnaires for surveying is that they are much more time efficient than giving interviews (Green, 2017). Interviews are meant to get in depth answers to questions pertaining to the study. This means they often require elaboration on questions and therefore take more time with some interviews requiring several hours just to obtain data from one respondent. Another advantage to using

questionnaires is that their results can be quickly and easily quantified to come up with a conclusion statement (ibid.). An example questionnaire is depicted below:

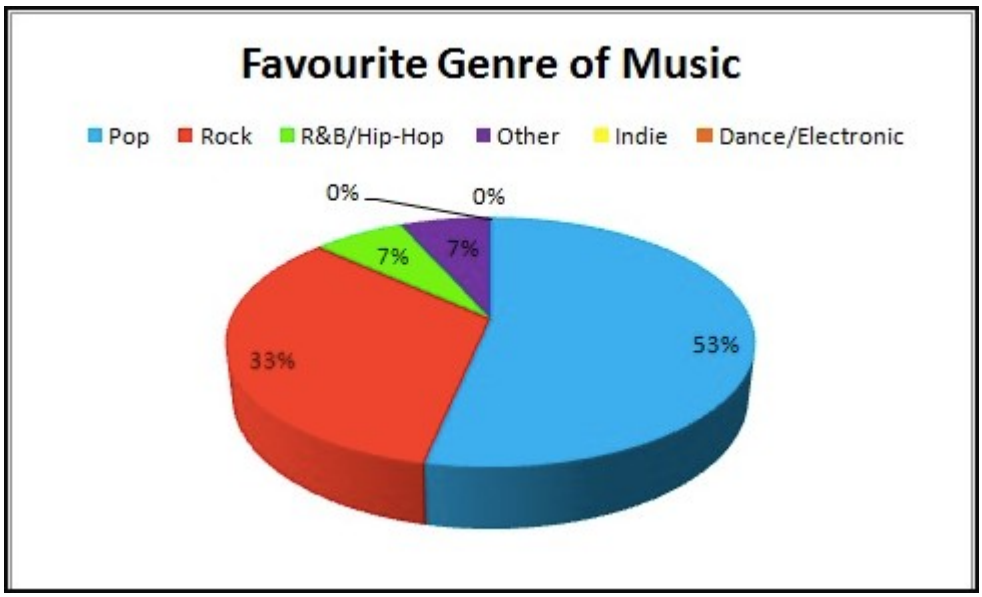


Figure 2.5: An example of questionnaire results for favorite genre of music in the form of a pie chart. Obtained from statcrunch.com

Based off the responses to this question, we can derive a finding: Pop and rock are the most popular genres of music. This statement is justified by specific evidence: Pop and rock in this case make up 86% of respondents answers to the questionnaire. Questionnaires rarely leave room for elaboration on topics so a respondent's answer can only vary based on the options they are given. Because this is the case it is much easier to quantify this data (Routledge, 2004). A final advantage of using a questionnaire is that they don't always need someone present to give it. Oftentimes questionnaires are given over email or online. This means that participants can fill out questionnaires conveniently and at their own pace creating a calmer environment for them (Green, 2017). In this aspect questionnaires have an advantage over interviews because interviews need someone to actually give the prompts whether it be in person or over the phone. This makes it easier on the person surveying as they do not need to waste time nor energy on verbally giving people the questions and recording their responses.

While there are many advantages to using questionnaires over surveys, there are also times when it is better to use interviews as a surveying instrument. Interviews are often used when trying to collect more in-depth and reliable data on a topic. Part of the reason why this is the case is that interviews allow the opportunity for follow up questions to be asked. This is also an advantage of using interviews because it provides more information on each subject being surveyed for the interviewer. This elaboration often includes reasoning as to why a participant answers a question in a certain way. This is not the case for questionnaires as we mentioned before that questionnaires usually contain close ended question that leave little to no room for explanation. Because of this information is often left out of questionnaires and makes them so that the conclusion statements from questionnaire results aren't as conclusive as they appear to be. Another reason why one might choose to use interviews as a survey instrument is that interviews can be given more casually than questionnaires. Semi-standardized interviews are interviews that are given casually and are meant to flow as a conversation rather than being strict and rigid (Key, 1997). Because these interviews are meant to be free flowing and akin to conversations, participants are often more open in their answers because they are given questions in a more comfortable environment. Because this is the case, interviewers are likely to get more honest and accurate data as opposed to people giving the responses the interviewer wants to hear. This is an advantage that using questionnaires cannot offer because the way the questions are supposed to be designed simply do not allow for it. This is why an interview is better for expanding on a specific section of a topic rather than a broad one such as sustainability.

To summarize, questionnaires and interviews both have their own advantages and disadvantages. One is not specifically better than the other overall as it truly depends on how many participants are necessary for a survey, specification of information needed, and how quickly data needs to be analyzed. These variables should all be taken into account when choosing whether to use questionnaires or interviews as a survey instrument. In the case of the Go Green Week project, however, questionnaires are ultimately the most convenient method of surveying, even if this is not the case for all types of research.

2.4.1: Surveying Incentives

While conducting surveys it is always best to offer some sort of incentive in exchange for the participant taking time out of their day to complete the survey. Krupnikov claims there are three main reasons why people stop to participate in surveys (Krupnikov, 2006):

- The participants want to be helpful
- The participants enjoy the topic of the survey
- The participants do it for a tangible benefit, which typically comes in the form of an incentive

This way people will have more motivation to participate and therefore the researchers can collect more data and thus yield stronger conclusions. The most common incentive for professionally done surveys is a cash incentive. These cash incentives often range anywhere from $2 to $100 depending on the importance of the survey given (Singer, 2012). However, just because cash incentives are the most common doesn't mean that other incentives can't be given out. Coupons, and food items are also somewhat common incentives when giving out a survey. For example while our group was surveying the population we would offer people a bag of dehydrated apples as an incentive. It was much easier to approach locals to fill out our survey when we had something to give out rather than approaching people empty handed. This feeling is why giving out incentives can benefit both parties as long as the incentive is within budget (Shaw, 2001). The participant is able to gain some type of reward for participation while the researcher can feel more confident in their approach if they have an incentive.

2.4.2: Survey Design and Analysis

The purpose of a survey is to collect data from people in a statistically sound and strategic manner, such that valid conclusions can be drawn from correct analysis of the responses. Survey design requires careful large-scale and small-scale planning, which Oppenheimer differentiates into research design and research technique. Research design refers to the ultimate goal of the survey, and the overall plan of how it is to be carried out. Good research design allows the survey to directly address an issue, to "provide specific

answers to specific questions." (Oppenheimer, 2000, p. 6). Research technique refers to the actual method of how the data is to be gathered, and how it is to be analyzed. Oppenheimer describes it as "concerned with measurement, quantification and instrument building" (ibid.).

Our research design was first and foremost to use a questionnaire, administered in person to pedestrians. The problem was to evaluate the Worcester population's awareness of specific sustainable habits they can practice in their everyday lives. In order to analyze the data gathered from surveying, we employed several common survey methodology devices common to questionnaires. In the design of questions, it was necessary to utilize an understanding of data measurement scales to ensure answers to the questions were reliably quantifiable and could be used for correlation. Correctly searching for relationships between variables required knowledge of variable categories, in order to be able to correlate questionnaire data with specific segments of our survey respondents. Finally, analysis of different questions and groups of questions required the use different analysis techniques, namely cross-tabulation.

The technique of cross-tabulation, or the creation of contingency tables, is essential to analysis of nominally scaled questions, namely those that determine demographic variables such as age and gender (Kent State University, 2017). A nominally scaled question is a question whose answer serves as a label. This is in contrast to an ordinal scaled question whose answer is a specific value on a scale. This value, however, is only quantifiable in terms of its order on the scale. Cross-tabulation tries to associate trends in answers to ordinal scaled questions to sections of the survey respondents, which are derived from their answers to nominally scaled questions (ibid.).

How often do you...?	Always	Sometimes	Rarely	Never	N/A
Turn off lights when leaving a room	☐	☐	☐	☐	☐
Switch off electrical devices when not in use	☐	☐	☐	☐	☐
Set heat to 18 degrees or lower during cold months	☐	☐	☐	☐	☐
Operate washing machines only when you have a full load	☐	☐	☐	☐	☐
Limit time spent in the shower	☐	☐	☐	☐	☐
Check recycling labels before selecting proper waste bin	☐	☐	☐	☐	☐

Figure 2.6: An example of an ordinal scaled question (retrieved from our survey)

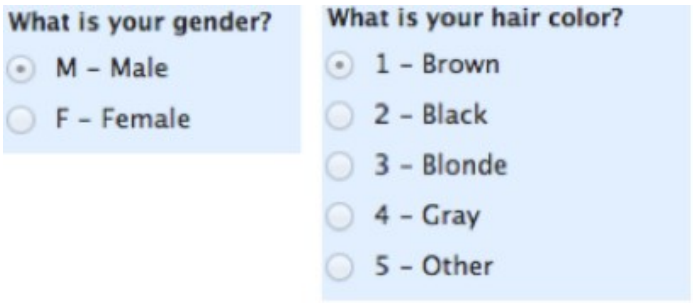


Figure 2.7: An example of a nominal scale question (retrieved from our survey)

Chapter 3: Methodology

Go Green Week has a focused set of objectives designed to foster continuous improvement of the event, which is nearing its second annual showing in the city center of Worcester, UK. The overall goal of the Go Green Week project is to promote growth in sustainable habits among Worcester citizens in order to propel the city's intention of improving sustainable development locally. This goal has been addressed through the completion of the following objectives and deliverables:

Objectives:

1. Launch the survey in the Worcester community, while attempting to best represent the Worcester's population in the data collected by having a set of participants that cover all demographics of the community as best as possible.
2. Quantify collected data through BOS (Bristol Online Survey tool) and draw conclusions on the data by itself, as well as through cross-tabulation with prior data collection of the previous spring Go Green Week group.
3. Gain endorsement, sponsorship, and support from local businesses by approaching them, and encouraging participation in Go Green Week taking place next spring.
4. Formulate two sets of recommendations for future Go Green Week project groups: one set of recommendations for the future spring groups, and a second set for the future fall groups.

Deliverables:

1. Design a survey instrument, in accordance with our sponsors' recommendation to build upon the previous staff and student surveys The new survey meets the need to be street-participant friendly, meaning an average completion time of less than five minutes by Worcester citizens. Validation of the new survey isn't given until piloting results of the survey has sponsor approval.

2. Design a Google Maps route that promotes local businesses agreeing to contribute towards the Go Green Week event for the following spring.

These objectives and deliverables enabled us to lay the groundwork for the spring Go Green Week group to follow. Our hope is that they will be able to focus entirely on setting up the event rather than having to orchestrate event planning with businesses in the spring, as was the case in the past. In this section we will focus on our research and deliverables for our project. Our research is contained in subsections 3.1.-3.3 and while our deliverables are contained in subsections 3.4 and 3.5.

3.1: Survey Instrument Design

In order to create the survey instrument, we utilized BOS (Bristol Online Survey) software provided by the University of Worcester Sustainability Department to develop a structured questionnaire. The previous group from last spring had designed two surveys, one for the staff, and the other for the students of the University of Worcester. The surveys contained different questions about the University of Worcester campus pertaining to green campus initiatives and events. These surveys were limited to these two populations, and were over 20 questions in length each, totaling 49 questions and took about 10 minutes to complete. Surveys of this length weren't practical for gathering data of the overall Worcester community, which was the new target population we were to study. Another weakness of the previous surveys were that they were designed for people that have a higher education on the topic of sustainability, rather than the local population. As a result many of the questions in the last two surveys use language that is hard to understand without a proper education on sustainability. Because of this we simplified the language of many of these questions and added in ten questions regarding the ten golden rules for living sustainably, created by the sustainability department (Appendix G). This way anyone could understand the survey, and we could see how often citizens engaged in basic sustainable habits like the golden rules.

In our first recommendation later in the report (chapter 5), we note that we would have gone about the process of designing the survey differently. The staff and student

surveys we had to base ours off of restricted us from the beginning due to their excessive length and lack of content relating to Go Green Week and general sustainable principles.

To modify the old surveys into our new one, we used the BOS software program that was used for the previous surveys. This software allowed us to transfer those surveys directly into a new survey file. This new survey had different functional needs, and served a different purpose than the staff and student surveys. The primary difference in the new survey was the change in target population. Additionally, the new survey had to be concise in order to make it a quick-to-complete, functional survey that pedestrians in Worcester were willing to fill out- as well as in less than five minutes' time. In addition to this change, questions that most closely related to the sustainable principles were selected from the staff and student surveys, and reworded to more accurately address the new target population.

3.2: Conducting the Survey

Before we started going out and asking individuals passing by to complete surveys, we knew that we didn't have the resources at our disposal to complete a simple random sample of the Worcester population. Had we been able to, which would've required far more time and money, we would have been gathering data of every Worcester resident on record and assigning a number to their name, after which a random number generator would select a series of numbers. From these numbers we would visit (or attempt to visit) the corresponding individual to mimic the process of statistically significant data collection through simple random sampling.

Because simple random sampling was not an option, we came up with an alternative method. This method involved us consciously attempting to include participants of all demographics measured by the survey, which included:

- Age;
- Gender;
- Postcode district;
- Education level;

The two demographics within our control were age and gender, as education level and postcode district were not as easy to identify by observing someone passing by. We tried

to incorporate every demographic to enough of a degree so that we would be able to make some loose comparisons, and cross tabulations with our data as well as data collected in the staff and students surveys last spring.

While surveying the local population, on occasion we would hand out thin-sliced dehydrated apples as an incentive for completing our survey. These were not only intended to be snack for the individual, but an example of how easy a sustainable food can be made by something you would have otherwise thrown away, such as in this case, where apples on the verge of spoiling are preserved through use of a dehydrator. In Chung's *Principles of Food Dehydration*, he explains the benefits of dehydrating any products:

> By reducing the moisture content of the product, the dehydration process makes it possible to limit microbial growth or other reactions. In addition to preserving the food from a microbiological standpoint, this process also enables preservation of its flavor and nutritional characteristics. Another obvious objective of dehydration is the significant reduction in product volume, which promotes efficiency in transportation and storage of the food product. (Chung, 1981)

Our group was originally going to use tablets provided by the sustainability department, however, they proved ineffective due to the BOS software's dependence on internet connection. This was not possible for us as many businesses will only give you their Wi-Fi passwords if you are a customer. As a result we used personal smartphone data to bring up the BOS survey link for people to then fill out through use of our phones.

3.2.1: Survey Study Locations

The specific reasoning behind each survey location was as follows:

Figure 3.1: High St. located in the Worcester City Center

- High Street: This was our primary location to survey Worcester citizens, and was selected due to there being the highest amount of foot traffic area in the city as the main street of the city of center.

Figure 3.2: Bromyard Rd. located in the St. John's section of Worcester

- Bromyard Rd. area - This location was chosen because of prevalence of young adults who frequented the street both for the variety of restaurants and as a result

of the housing being especially suited for young, working Worcester citizens who would be done with school and not necessarily have a lot of time to shop in town.

Figure 3.3: The Hive

- The Hive - This library/community center was visited frequented by two key demographics: the elderly and young parents. The elderly were challenging to find elsewhere because they did not favor walking around High Street as much. Young parents would never complete surveys with young children in town, but when their children were with reading groups or in the children's section, they were far more likely to fill out the survey.

3.3: Data Organization and Quantification

Our survey data was aggregated and analyzed using BOS academic software belonging to the University of Worcester. The software provided us with different data presentation and manipulation tools, of which we used to cross tabulate question sets of data from our new survey. Additionally, we used these tools to compare our new survey results to the past staff and student survey results in order to see any changes in sustainable habits among the participant population, as well as any change in their perception of sustainability. When cross-tabulating our data we compared several of our

survey questions with three main demographics from our survey: age, gender, and level of education. Data findings can be found in chapter 4. More specifically our cross-tabulated data findings can be found in subsections 4.2-4.4.

3.4: Local Business Engagement

In order to gain local business support for the Spring 2018 Go Green Week, it was necessary for us to reach out and establish lines of contact far in advance for the next fair. The reason we were assigned to this task is because the previous Go Green Week group insisted that it was imperative to establish business connections prior to the following spring group's arrival, otherwise potential for continual growth in size of the Go Green Week event would be limited in years to come. This was a result of businesses needing more than a few weeks' notice to go through their respective company's protocol to be able to authorize and maximize contributions in any form for the event. As a result, we designed and enacted a methodology for contacting local business contacts that can be utilized by Worcester, U.K. Fall groups for years to come.

3.4.1: Formal Business Email

In order to initiate contact with local businesses within the Worcester community, we created a standard business email template **[Appendix D]** that covered all important aspects and details of Go Green Week. This template offered the Google Maps route initiative to businesses, which would advertise them as businesses that support sustainability on a route connecting all stores willing to work with the sustainability fair. We followed up this offer with an explanation of Go Green Week's purpose and general goals. To wrap the email up, we stated our intention to visit the individual local businesses in the day(s) following the email. Specific details related to Go Green Week were also included so the businesses have something in writing to refer to at any time.

3.4.2: Meetings with Store Owners

In the days following our business emails, we visited the local businesses to discuss any uncertainties the owners or managers may have had about aspects of the event, as well

as to build our relationship with them in person. Some businesses were very receptive to the idea of helping contribute resources for the event, and were more than willing to give specific contact information as well as, on occasion, identify individuals working within the business to contact by name in spring. In order to effectively sell the idea of helping the Go Green Week efforts for next April, we needed a well-versed elevator pitch that showed professionalism and confidence in the project being promoted. This was vital in confirming their support for the event. Businesses that gave contact information for future use were placed into a contact directory **[Appendix J]**, a Google Sheet in this case, to consolidate all of the information into a single organized location for the following group to have at their disposal when reconnecting with these businesses early in the spring.

3.5: Google Map Business Route

Incentivizing local business involvement for Go Green Week proved important for us when in the process of gaining business contacts and sponsorship. A Google Maps route was created to incorporate the local businesses that agreed to work with Go Green Week, its sponsors, and stakeholders. To create a route we first established pinpoints for each of the business locations. Following this, we went through a trial and error process in order to designate the shortest walking distances between different stores until we found a route that minimized walking and created a circuit for consumers to most conveniently follow when using the route. This Google Map Route link and image can be found in **[Appendix F]**. As is exemplified in the image of the route, all local business locations are incorporated into a circuit that any Worcester consumer interested in supporting sustainable business practice can access. Once engaging with local businesses has concluded, businesses are provided with the route link to promote this route to their customer bases.

Chapter 4: Findings, Analysis, and Recommendations

Through analyzing the data we collected from surveying 142 Worcester citizens as well as talking to several local businesses our group came up with several findings on sustainability habits, recruiting businesses, and general convenience of our project. We came up with a list of eight findings as well as recommendations regarding those findings. Our findings will be split into two categories. The first category of findings will be based on general observation our group had, while the second category of findings will be based off the data we collected from our survey. These findings are described in detail in the following sections and subsections. It should be noted that 133 of the 142 total people we surveyed chose to provide their demographic information. Since this was relevant for the vast majority of findings, the final sample size for our findings is **n=133.**

4.1: Invalidity of Data Comparisons to Last Spring Surveys

FINDING: The results of our survey cannot be compared to those of the student and staff surveys.

RECOMMENDATIONS: Future groups should only use our survey when comparing collected data. They should use the *exact* same questions that we used if they are to properly compare the data and come up with concrete findings. This is because they will be surveying the Worcester population just as we did and the questions have already been approved by the sustainability department and been piloted. Because the surveys from last year were meant for student and staff it is not possible to come up with statistically sound conclusions as their survey and ours differed too greatly.

An unfortunate consequence of having to rearrange the questions of last spring' student and staff surveys in order to fit our objectives was that they could not accurately compared. This was due to several significant discrepancies between our survey and the student and staff surveys:

The surveys were designed for different target demographics: Our survey was aimed at the Worcester community in general, whereas the two spring surveys were targeted towards University of Worcester Students and Staff.

The surveys were administered using drastically different methods. Our survey was exclusively given out personally to pedestrians in locations around Worcester, and was less than 5 minutes in duration. In contrast, the spring surveys were designed to be completed over 10 minutes, and were mainly distributed via email.

As a result of the differing completion times of our survey and the student and staff surveys, there was large numerical disparity in the number of questions. Our survey consisted of seven total questions, in comparison to a combined 49 between the two spring surveys.

Due to the different targets of our survey and the spring surveys, the demographics of our respondents differed widely from the spring surveys'. For example, the respondents of the student survey were 71.91% female, and 48.12% of ours were female. More glaring differences include:

The student survey predictably has a majority of young respondents, with 65.85% of their respondents being under 25. Ours has only 25.65% aged under 25.

Neither the staff nor student survey has any respondents aged 55 and over, whereas 18.05% of our respondents were aged 55 and over.

4.2: Comparing Gender to Various Sustainable Activities

FINDING: Female participants were more likely to partake in sustainable activities than males.

Overall, we found that females were, in more instances than not, being more sustainable than males in regards to sustainable activities covered in the survey. This was a recurring theme among different cross tabulations of genders sustainability questions. The question that most backed this finding were "Growing vegetables" (4.2.2) which is highlighted in the bar graph figure 4.1. "Turning off lights when leaving a room" (4.2.5) was also beneficial towards the finding. Both show females practicing these sustainability-promoting activities 18% more often than their male counterparts. Additionally, even in cases where neither gender had a high percentage of "yes" answers, such as for the "litter picks" question (4.2.8), females still answered yes 8% more than male participants. Even with the general trend showing females practicing sustainable activities more often, it is not

without faults. There was a contradicting result in the question about "limiting shower time" (4.2.6) which had a much higher percentage (22%) of female respondents answering "Never" on limiting shower time in comparison to males, who only answered "Never" 8.96% of the time. All evidence that contributes to these findings is found within the chapter 4.2 subsections that follow.

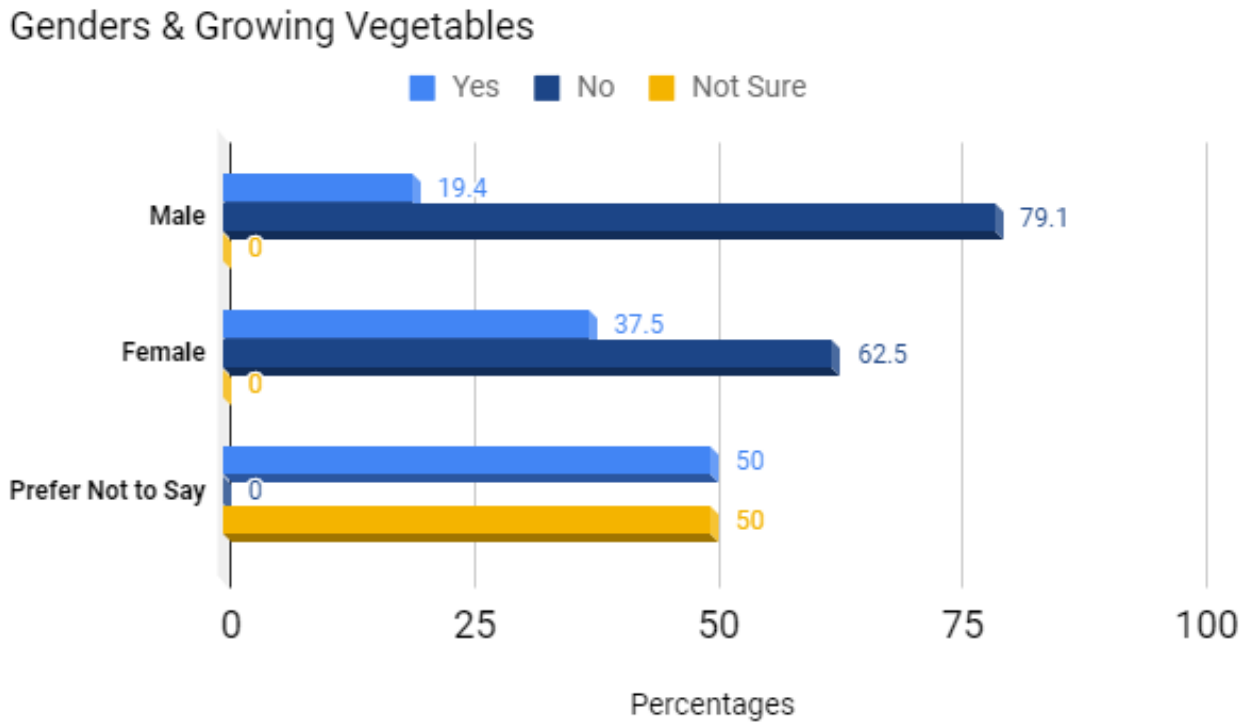


Figure 4.1

RECOMMENDATIONS: For Go Green Week next spring, event organizers should focus on educating more of the local male population on sustainable habits, as the chance could be greater that they are educating a male on a new or unpracticed sustainable activity that they didn't practice, whereas females could more likely be already practicing those habits. Additionally, it would be beneficial to create activities for Go Green Week that more effectively catch the male population's attention or interest. By increasing the event appeal to males, they might be more inclined to participate in a Go Green Week educational activity or talk with event organizers who could discuss ways to positively impact local sustainability in their everyday lives.

4.2.1: Gender vs. Eating Locally Grown

Gender	Eat more locally grown fruits and vegetables			No answer
	Yes	No	Not sure	
Male	41.79%	40.30%	17.91%	0.00%
Female	54.69%	23.44%	21.88%	0.00%
Prefer not to say	50.00%	0.00%	50.00%	0.00%
No answer	22.22%	55.56%	22.22%	0.00%

Figure 4.2

The data between the participants' genders and their answers for eating locally grown fruit and vegetables shows a few noteworthy trends. Males answer "Yes" 42% of the time versus 55% for females, making for a 13% differential. Additionally, when looking at the overall layout of the data regardless of gender, a substantial portion of the participants answered "Not sure."

4.2.2: Gender vs. Growing Vegetables

Gender	Growing vegetables			No answer
	Yes	No	Not sure	
Male	19.40%	79.10%	0.00%	1.49%
Female	37.50%	62.50%	0.00%	0.00%
Prefer not to say	50.00%	0.00%	50.00%	0.00%
No answer	33.33%	66.67%	0.00%	0.00%

Figure 4.3

The data between the participants' genders and their answers for growing vegetables shows that over 37% of females grow their own vegetables, whereas only 19% of males do,

making for an 18% differential in yes responses, favoring females. Overall, most individuals surveyed don't grow their own vegetables.

4.2.3: Gender vs. Turn down the Thermostat and Wear an Extra Layer

Gender	Turn down the thermostat and wear an extra layer			No answer
	Yes	No	Not sure	
Male	35.82%	59.70%	4.48%	0.00%
Female	18.75%	79.69%	1.56%	0.00%
Prefer not to say	50.00%	50.00%	0.00%	0.00%
No answer	33.33%	66.67%	0.00%	0.00%

Figure 4.4

This data exhibits the variation in female and male participants' willingness to turn down the heat, choosing to instead wear an additional layer to keep warm. Contrary to previously shown results on sustainable habits compared between opposite genders, males were more inclined to wear an extra layer of clothing than females were. While the overall data showed individuals that chose to practice this sustainable habit were in the minority, males were more likely to do this over females by 17% (35.82% versus 18.75%).

4.2.4: Gender vs. Donating Clothes

Gender	Clothing donation			No answer
	Yes	No	Not sure	
Male	53.73%	46.27%	0.00%	0.00%
Female	60.94%	39.06%	0.00%	0.00%
Prefer not to say	50.00%	50.00%	0.00%	0.00%
No answer	66.67%	33.33%	0.00%	0.00%

Figure 4.5

This cross tabulation of gender and clothing donations exhibits a slight difference in male and female participants' willingness to donate clothes. While both groups had the majority of their respective respondents say they did in fact donate, over 6% more females donated clothing in contrast to males (53.73% versus 46.27%).

4.2.5: Gender vs. Turning off the Lights When Leaving a Room

Gender	Turn off lights when leaving a room					No answer
	Always	Sometimes	Rarely	Never	N/A	
Male	49.25%	43.28%	4.48%	2.99%	0.00%	0.00%
Female	67.19%	31.25%	1.56%	0.00%	0.00%	0.00%
Prefer not to say	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
No answer	55.56%	44.44%	0.00%	0.00%	0.00%	0.00%

Figure 4.6

The data comparing female and male participants' tendencies to turn off the lights when leaving a room shows a very clear pattern between habitual people of this habit: 67% of females said they always practiced this habit, whereas males drop a fair percentage, with only 49% considering themselves to be in the "always" category. Also noteworthy, no female respondents said they never practiced this, while a small but nonetheless present 3% of males said they constantly left room lights always on.

4.2.6: Gender versus Limiting Shower Time

Gender	Limit time spent in the shower					No answer
	Always	Sometimes	Rarely	Never	N/A	
Male	16.42%	46.27%	28.36%	8.96%	0.00%	0.00%
Female	18.75%	39.06%	20.31%	21.88%	0.00%	0.00%
Prefer not to say	0.00%	50.00%	50.00%	0.00%	0.00%	0.00%
No answer	33.33%	33.33%	22.22%	11.11%	0.00%	0.00%

Figure 4.7

The cross tabulation of male and female participants' and their shower habits shows that females barely exceed males in those who "Always" limit time in the shower, 18.75% to 16.42%. However, the most intriguing result is at the other end of the spectrum, where those who never limit shower time is dominated by females. Almost 22% of females never limit shower time, versus a less substantial 9% of males. Overall, both genders' top answer was "sometimes" with both within 10 percentage points of 40%.

4.2.7: Gender versus Using Public Transport

Gender	Using public transport			No answer
	Yes	No	Not sure	
Male	88.06%	11.94%	0.00%	0.00%
Female	76.56%	23.44%	0.00%	0.00%
Prefer not to say	50.00%	50.00%	0.00%	0.00%
No answer	88.89%	11.11%	0.00%	0.00%

Figure 4.8

The cross tabulation between genders and public transportation usage show a slight variation in between males and females. Overall, it's clear that the majority of both genders use public transportation. However, nearly 90% of males utilize it, whereas about 75% of females say they do. This nearly 15% differentiation is fairly significant.

4.2.8: Gender versus Litter Picks

Gender	Litter picks			No answer
	Yes	No	Not sure	
Male	11.94%	83.58%	2.99%	1.49%
Female	20.31%	78.12%	1.56%	0.00%
Prefer not to say	50.00%	50.00%	0.00%	0.00%
No answer	33.33%	66.67%	0.00%	0.00%

Figure 4.9

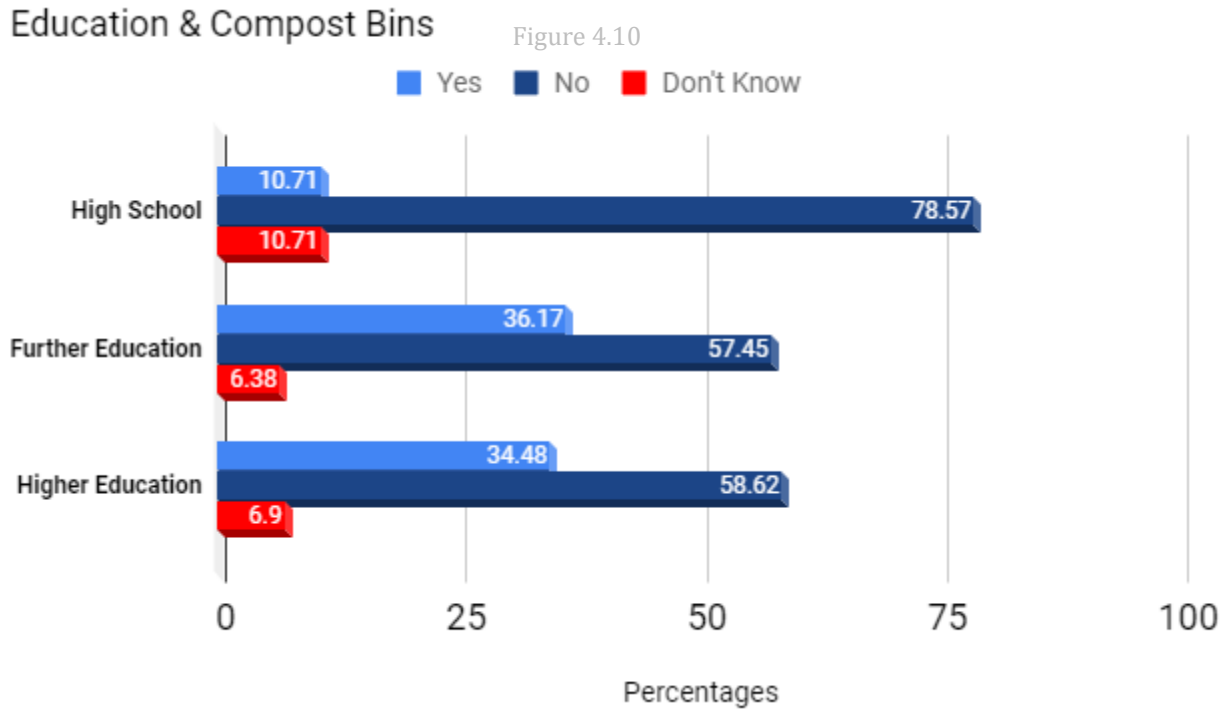
Overall, litter picks weren't an activity often done by participants. Between males and females, a slightly higher number of females had taken part in litter picks, with over 20% saying they had, whereas under 12% of males had partaken in this activity.

4.3: Comparing Education to Various Sustainable Activities

EDUCATION FINDING #1: Participants who ended their education before or upon completion of high school were less likely to practice sustainable habits.

In subsections 4.3.1-4.3.4, all statistical trends backed this notion, as high school participants answered "Yes" to each of these questions the least of the three groups. Even though the number of participants surveyed doesn't suffice for it to be a statistically significant finding, among participants alone, there is a significant and clear trend spanning multiple cross tabulations. The data that best encapsulates this finding is the cross tabulation between education and compost bin ownership (4.3.1), of which only 10.71% of high school participants answered "No". Additionally, 10.71% in the grouping answered "Don't Know". This data on compost bins is highlighted below in Figure 4.10. For comparison, further education and higher education both owned compost bins around 35% of the time, in addition to a lesser 7% of their group demographic answering "Don't know". Evidence pertinent to this finding is found throughout the subsections that follow.

Figure 4.10



RECOMMENDATIONS: We recommend that the next Go Green Week promotes the money-saving benefits people will see by incorporating green energy devices into their households. Additionally, it would be beneficial to promote during the fair that wearing extra clothes rather than turning up the thermostat could prove extremely cost-effective in terms of potential money saved on a heating bill. Finally, an event educating the community about how the higher initial cost of energy-saving light bulbs is offset and surpassed by the long-term savings made an the electric bill (U.S. Dept. of Energy, 2017).

4.3.1: Education vs. Compost Bins

What is your highest level of education?	Compost bins			No answer
	Yes	No	Don't know	
High School	10.71%	78.57%	10.71%	0.00%
Further Education	36.17%	57.45%	6.38%	0.00%
Higher Education	34.48%	58.62%	6.90%	0.00%
No answer	22.22%	66.67%	11.11%	0.00%

Figure 4.11

This cross tabulation of education and compost bins shows a clear disparity among high school educated participants and those with further or higher education. Just under 11% of those who completed schooling upon completion of high school had compost bins, with another 11% answering “Don’t Know”. For comparison, both further education and higher education had nearly 35% for “Yes” and less than 7% for “Don’t Know”.

4.3.2: Education vs. Renewable Energy Systems

What is your highest level of education?	Renewable energy systems, e.g. solar			No answer
	Yes	No	Don't know	
High School	7.14%	85.71%	7.14%	0.00%
Further Education	19.15%	68.09%	12.77%	0.00%
Higher Education	31.03%	55.17%	12.07%	1.72%
No answer	55.56%	33.33%	11.11%	0.00%

Figure 4.12

This cross tabulation between education and renewable energy systems shows a significant and steady trend in which high school educated participants have the clear lowest presence of renewable energy systems in their home (7%). Additionally, the trend continues with 19% of further education individuals having renewable systems, and finally higher education with the highest percentage of renewable systems among the three groups, with 31%. Interestingly enough, high school had the lowest percentage in answering "Don't Know" at just 7%, versus 12% "Don't Know" for the other two.

4.3.3: Education vs. Turning Down Thermostat for an Extra Layer

What is your highest level of education?	Turn down the thermostat and wear an extra layer			No answer
	Yes	No	Not sure	
High School	10.71%	85.71%	3.57%	0.00%
Further Education	31.91%	65.96%	2.13%	0.00%
Higher Education	32.76%	63.79%	3.45%	0.00%
No answer	33.33%	66.67%	0.00%	0.00%

Figure 4.13

The cross tabulation between education and turning down the thermostat to wear an extra layer highlights a major gap between high school participants and the remaining participants. Specifically, only 10% of high school individuals practiced this sustainable habit, whereas both further education and higher education were over 20% better at practicing this energy saving habit (with both of their percentages in the low 30% range).

4.3.4: Education versus Energy Saving Light Bulbs

What is your highest level of education?	Energy-saving light bulbs			No answer
	Yes	No	Don't know	
High School	42.86%	21.43%	35.71%	0.00%
Further Education	44.68%	27.66%	27.66%	0.00%
Higher Education	60.34%	20.69%	18.97%	0.00%
No answer	44.44%	44.44%	11.11%	0.00%

Figure 4.14

Cross tabulation between education and energy saving light bulbs yields two noteworthy trends: the more educated participants were, the more likely it was they had energy-saving light bulbs and the less likely it was that they answered "Don't Know" for this question. However, it should be noted that a significant percentage of every group either didn't know what qualifies as an energy-saving light bulb, or doesn't know if they use them, with the "Don't Know" percentages ranging from 19% (Higher Education) up to 35% (High School).

EDUCATION FINDING #2: Among participants, having a higher level of education resulted in a higher likelihood of being more sustainable through practice or owned appliances.

In the following subsections of 4.3 are further in-depth cross sectional data of questions used in the survey. Additionally, section 4.3.2 encapsulates the pattern described by finding #2. Given the data trend in that one exemplifies a steady increase in "Yes" percentages among the three groups as the education level goes up, (from 7% to 19% to 31%), there is a clear backing to this finding, that is further evidenced through the remaining subsections of 4.3. Specifically, in section 4.3.9, a cross tabulation between education and reusable mugs, there were drastic jumps between varied education levels of participants that aligned with this finding. High school educated respondents had reusable mugs 50% of the time, further education individuals answered "Yes" 62% of the time, while higher education topped the mark with 74%. This clear jump epitomizes the finding. While this finding is

fairly prevalent among different cross tabulations, there are a couple instances where the data contradicts the finding. Such is the case in section 4.3.1 where education and compost bins shows a slightly higher percentage of further education participants owning compost bins (36%) in comparison to higher education participants (34%).

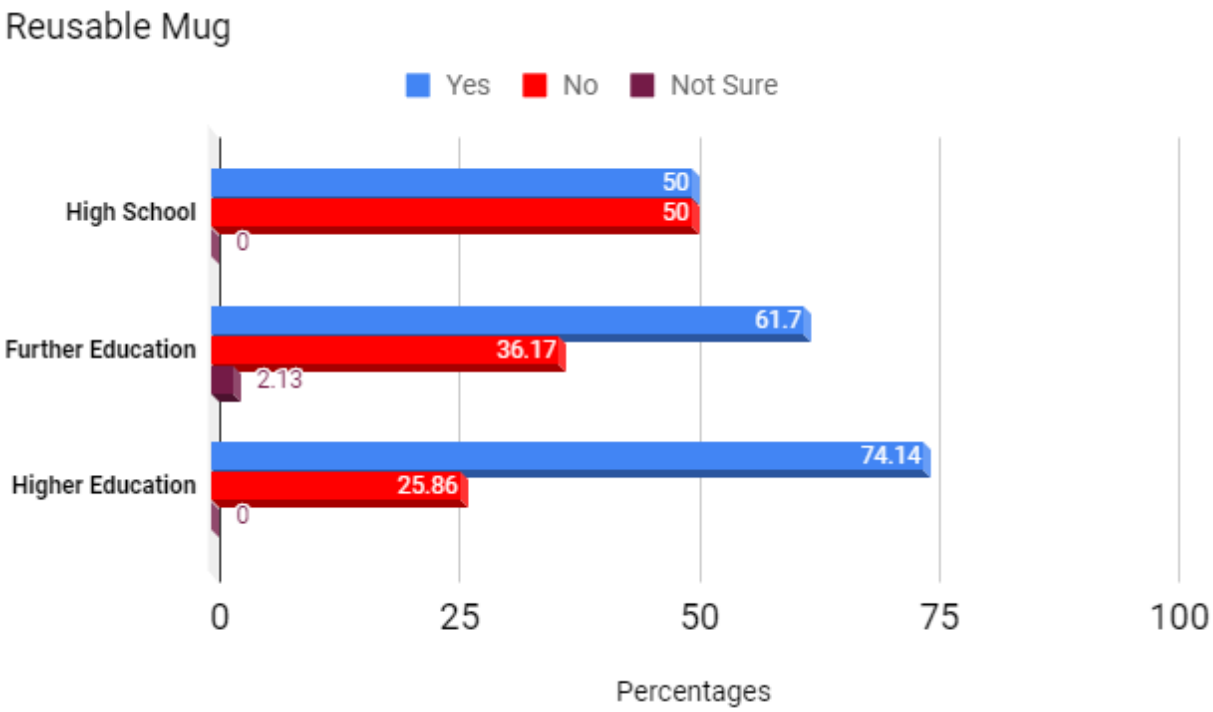


Figure 4.15

RECOMMENDATIONS: Inclusion of Go Green Week activities that appeal to tradesmen and others having jobs that require an education lower than that of a higher education. Additionally, consideration of Go Green Week event education on general awareness of time wasted in the shower may be beneficial, as even among all education levels, there was a general lack of willingness to be sustainable in this way. Finally, a display showing how much money can be saved through some simple calculations of energy saving methods displayed throughout this evidence may be beneficial to making people realize the financial ramifications of their regular habits.

4.3.5: Education vs. Limit Time Spent in the Shower

What is your highest level of education?	Limit time spent in the shower					No answer
	Always	Sometimes	Rarely	Never	N/A	
High School	7.14%	39.29%	28.57%	25.00%	0.00%	0.00%
Further Education	19.15%	46.81%	29.79%	4.26%	0.00%	0.00%
Higher Education	20.69%	41.38%	18.97%	18.97%	0.00%	0.00%
No answer	33.33%	33.33%	22.22%	11.11%	0.00%	0.00%

Figure 4.16

This cross tabulation of education and limiting time spent in the shower shows high school educated participants have the largest proportion of individuals put "Never" when asked about limiting shower time, 25% to be exact. Additionally, the high school group has the lowest percent to put "Always" at 7.14%. On the contrary, higher educated participants "Always" limited shower time the highest percent of the time, barely beating out further education 20.69% to 19.15%. Oddly enough, however, higher education also had a high percentage of "Never" respondents, at 19%.

4.3.6: Education vs. Having Water Saving Items

What is your highest level of education?	Water-saving items (e.g. low-flow shower heads)			No answer
	Yes	No	Don't know	
High School	39.29%	28.57%	32.14%	0.00%
Further Education	40.43%	34.04%	25.53%	0.00%
Higher Education	51.72%	31.03%	17.24%	0.00%
No answer	77.78%	11.11%	11.11%	0.00%

Figure 4.17

This cross tabulation of energy and having water saving items displays a clear incline in "Yes" proportions among participants as their highest level of education furthers, whilst their "Don't Know" responses diminish steadily. Specifically looking at the numbers, high

school educated respondents answered "Yes" 39% of the time, further education 40% of the time, and higher education almost 52% of the time. For "Don't Know," high school participants responded this 32% of the time, further education 25.5% of the time, and higher education only 17% of the time.

4.3.7: Education versus Eating More Locally Grown Produce

What is your highest level of education?	Eat more locally grown fruits and vegetables			No answer
	Yes	No	Not sure	
High School	39.29%	32.14%	28.57%	0.00%
Further Education	42.55%	40.43%	17.02%	0.00%
Higher Education	56.90%	24.14%	18.97%	0.00%
No answer	22.22%	55.56%	22.22%	0.00%

Figure 4.18

For this cross tabulation, as education level increased, answering "Yes" to eating more locally grown produce increased. This is proven as high school answered "Yes" 39% of the time, further education 43% of the time, and 57% of the time for higher education. Additionally, high school had a larger proportion of "Not Sure" responses, at 29%, contrary to the other two groups hovering slightly below 20%.

4.3.8: Education versus Light Motion Sensors

What is your highest level of education?	Light motion sensors			No answer
	Yes	No	Don't know	
High School	39.29%	60.71%	0.00%	0.00%
Further Education	44.68%	55.32%	0.00%	0.00%
Higher Education	51.72%	48.28%	0.00%	0.00%
No answer	77.78%	22.22%	0.00%	0.00%

Figure 4.19

In this cross tabulation between education and light motion sensors, it was quickly apparent everyone had understood what a light motion sensor was. This set of data had some of the more consistently increasing "Yes" responses than most questions. High school educated participants answered "Yes" nearly 40% of the time, with increases in intervals of about 5% for further education (45%) and higher education (52%).

4.3.9: Education versus Using Your Own Mug, Not Disposables

What is your highest level of education?	Use your own mug, not disposables			No answer
	Yes	No	Not sure	
High School	50.00%	50.00%	0.00%	0.00%
Further Education	61.70%	36.17%	2.13%	0.00%
Higher Education	74.14%	25.86%	0.00%	0.00%
No answer	55.56%	44.44%	0.00%	0.00%

Figure 4.20

Cross tabulations of education and using your own mug, not disposables, resulted in the most evident instance of a clear trend in increasing usage as the participants' education levels increased. Even for high school participants, the percentage of respondents using their own mugs was fairly high, at a promising 50%. To build upon this, further education individuals answered "Yes" 62% of the time, while higher education topped the mark with 74%.

4.4: Comparing Age to Various Sustainable Activities

Age	Hold video conferences and Skype calls as an alternative to traveling to meetings			No answer	Totals
	Yes	No	Not sure		
Under 25	17	14	3	0	34
25 - 34	16	6	2	0	24
35 - 44	14	8	1	0	23
45 - 54	14	11	3	0	28
55 - 64	9	7	0	0	16
65 & over	1	7	0	0	8
No answer	4	5	0	0	9
Totals	**75**	**58**	**9**	**0**	**142**

Figure 4.21

FINDING: Among survey participants, there are generally mixed, inconsistent trends among the age demographic groupings and sustainable habits.

In the evidence, there are a variety of questions cross tabulated with age in an attempt to try and draw findings by looking at different aspects of sustainability and perspectives. Unfortunately, there is no consistency among a majority of the question results, leading us to deem the survey finding for this section to be mixed. For instance, there is a clear pattern of decline in both buying secondhand (4.4.7) and volunteering in the community (4.4.8). This decline specifically depicts the "Under 25" category in both cases to participate the most in these activities, with the trend continually declining as each age group passes, until reaching the cross tabulation lows in the "65 & Over" category for both. However, the rest of the questions in the evidence section do not agree with these trends. Overall, it does appear as though adults of age "65 & Older" lack involvement in sustainable activities and habits, but given we were only able to get 8 survey participants within this category, it would be inaccurate to suggest that these 8 responses could lead to any substantial findings. Additionally, sections 4.3.2 and 4.3.3 lack any real trends, as is stated in their respective sections.

RECOMMENDATIONS: We recommend ensuring, when surveying the public, to get a more well-rounded representation of the local community in terms of age, as there could be more substantial findings to be uncovered in the future in respect to age that we were unable to look into. This was due to a lack of participants in the category "65 & Older." Additionally, we believe gathering larger numbers of participants earlier on in the survey collection process would be beneficial towards finding more substantive findings in the age demographic.

4.4.1: Age versus Clothing Donation

Age	Clothing donation			No answer
	Yes	No	Not sure	
Under 25	52.94%	47.06%	0.00%	0.00%
25 - 34	62.50%	37.50%	0.00%	0.00%
35 - 44	60.87%	39.13%	0.00%	0.00%
45 - 54	64.29%	35.71%	0.00%	0.00%
55 - 64	56.25%	43.75%	0.00%	0.00%
65 & over	25.00%	75.00%	0.00%	0.00%
No answer	66.67%	33.33%	0.00%	0.00%

Figure 4.22

This section shows that participants aged "65 & Over" were the least likely to donate clothes, with "Under 25" being the next lowest category, at 53%. Groupings within 25-54 years of age aligned similarly.

4.4.2: Age vs. Checking Bin Labels Before Throwing Waste Out

Age	Check recycling labels before selecting proper waste bin					No answer
	Always	Sometimes	Rarely	Never	N/A	
Under 25	23.53%	35.29%	20.59%	20.59%	0.00%	0.00%
25 - 34	37.50%	33.33%	12.50%	12.50%	4.17%	0.00%
35 - 44	13.04%	26.09%	30.43%	30.43%	0.00%	0.00%
45 - 54	17.86%	50.00%	14.29%	10.71%	7.14%	0.00%
55 - 64	31.25%	25.00%	31.25%	12.50%	0.00%	0.00%
65 & over	12.50%	12.50%	0.00%	75.00%	0.00%	0.00%
No answer	33.33%	55.56%	11.11%	0.00%	0.00%	0.00%

Figure 4.22

This cross tabulation exhibits a few key noteworthy observations of our participant population's data. For instance, those 65 & older are least like to always check the proper waste bin, with 12.5% always and 75% never checking the labels. Additionally, there are mixed results, therefore lacking overall trends. Inconclusive fluctuations from age range to age range are prevalent.

Section 4.4.3: Age vs. Lowering Heat and Wearing Layers

Age	Turn down the thermostat and wear an extra layer			No answer
	Yes	No	Not sure	
Under 25	41.18%	47.06%	11.76%	0.00%
25 - 34	20.83%	79.17%	0.00%	0.00%
35 - 44	34.78%	65.22%	0.00%	0.00%
45 - 54	17.86%	82.14%	0.00%	0.00%
55 - 64	18.75%	81.25%	0.00%	0.00%
65 & over	25.00%	75.00%	0.00%	0.00%
No answer	33.33%	66.67%	0.00%	0.00%

Figure 4.23

This section shows more willingness to partake in this sustainable habit among younger participants under 25. In a near second is the 35-44 age group, with "65 & Over" being the third most common group to consciously save heat. However, overall there aren't any apparent trends that stand out as people age.

4.4.4: Age vs. Energy-Saving Light Bulbs

Age	Energy-saving light bulbs			No answer
	Yes	No	Don't know	
Under 25	70.59%	14.71%	14.71%	0.00%
25 - 34	41.67%	33.33%	25.00%	0.00%
35 - 44	43.48%	30.43%	26.09%	0.00%
45 - 54	67.86%	14.29%	17.86%	0.00%
55 - 64	31.25%	37.50%	31.25%	0.00%
65 & over	0.00%	12.50%	87.50%	0.00%
No answer	44.44%	44.44%	11.11%	0.00%

Figure 4.24

In this cross tabulation of age and energy-saving light bulbs, there is a clear lack of understanding as to what energy-saving light bulbs are, and it crosses all age groups. Additionally, the two age groups that have the least energy-saving light bulbs in their homes are the 55-64 (31%) and 65 & over (0%) groups. The two age ranges with the most knowledge are the "Under 25" (71%) and 45-54 (68%) groups.

4.4.5: Age vs. Limiting Time in the Shower

Age	Limit time spent in the shower					No answer
	Always	Sometimes	Rarely	Never	N/A	
Under 25	17.65%	47.06%	29.41%	5.88%	0.00%	0.00%
25 - 34	12.50%	50.00%	20.83%	16.67%	0.00%	0.00%
35 - 44	26.09%	34.78%	30.43%	8.70%	0.00%	0.00%
45 - 54	17.86%	46.43%	17.86%	17.86%	0.00%	0.00%
55 - 64	18.75%	37.50%	25.00%	18.75%	0.00%	0.00%
65 & over	0.00%	25.00%	25.00%	50.00%	0.00%	0.00%
No answer	33.33%	33.33%	22.22%	11.11%	0.00%	0.00%

Figure 4.25

This cross tabulation of age and limiting shower time depict a clear lack of willingness to limit shower time that spans across all ages. The highest percentage answer for every age range was the "sometimes" category, except it was "Never" for those "65 & Older" (50%).

4.4.6: Age vs. Switching off Devices Not in Use

Age	Switch off electrical devices when not in use					No answer
	Always	Sometimes	Rarely	Never	N/A	
Under 25	38.24%	52.94%	2.94%	5.88%	0.00%	0.00%
25 - 34	58.33%	37.50%	4.17%	0.00%	0.00%	0.00%
35 - 44	56.52%	34.78%	4.35%	4.35%	0.00%	0.00%
45 - 54	53.57%	39.29%	3.57%	3.57%	0.00%	0.00%
55 - 64	56.25%	37.50%	6.25%	0.00%	0.00%	0.00%
65 & over	37.50%	62.50%	0.00%	0.00%	0.00%	0.00%
No answer	77.78%	22.22%	0.00%	0.00%	0.00%	0.00%

Figure 4.26

In the cross tabulation between age and electrical devices, the oldest and youngest age groups have the least likelihood of turning off a device not in use according to participant

data. Under 25 category was 38% likely to turn it off, and 65 & over was the same. Additionally, very few individuals selected “rarely” or “never” with no group breaking 10%. Outside of these two findings there were no significant conclusions.

4.4.7: Age vs. Buying Secondhand

Age	Buying secondhand			No answer
	Yes	No	Not sure	
Under 25	76.47%	23.53%	0.00%	0.00%
25 - 34	62.50%	37.50%	0.00%	0.00%
35 - 44	69.57%	30.43%	0.00%	0.00%
45 - 54	46.43%	50.00%	3.57%	0.00%
55 - 64	43.75%	56.25%	0.00%	0.00%
65 & over	12.50%	75.00%	12.50%	0.00%
No answer	66.67%	33.33%	0.00%	0.00%

Figure 4.27

There is a very clear downward trend in buying secondhand habits, from youngest to oldest. The “Under 25” group has bought secondhand most often of any age group, with nearly 77% having done so. For the most part, with the exception of the small upward change in percentages from ages 25-34 results to 35-44 (63% to 70%), the proportion of users answering “Yes” was continually declining, bottoming out with only 12.5% of those aged “65 & Older” buying secondhand.

4.4.8: Age vs. Volunteering in the Community

Age	Volunteering in the community			No answer
	Yes	No	Not sure	
Under 25	58.82%	41.18%	0.00%	0.00%
25 - 34	50.00%	45.83%	4.17%	0.00%
35 - 44	39.13%	52.17%	8.70%	0.00%
45 - 54	46.43%	50.00%	3.57%	0.00%
55 - 64	25.00%	75.00%	0.00%	0.00%
65 & over	12.50%	87.50%	0.00%	0.00%
No answer	66.67%	33.33%	0.00%	0.00%

Figure 4.28

This cross tabulation between age and volunteering in the community shows another decline, with "Under 25" participants saying yes to volunteer in the community the most at 59%. The overall downward trend in participation in community volunteering continues, until it bottoms out at 12.5% participation in the "65 & over" category.

4.5: Lack of Awareness of Sustainable Technology Systems

While creating our modified survey our group along with the University of Worcester sustainability department included questions based off the different types of sustainable technologies that are available to homeowners. Technologies such as "water-saving devices" and "energy-saving light bulbs" have been trending both in the UK and around the world. Our goal was to see not only how much they are used by the locals but how aware they are of these relatively recent pieces of technology.

4.5.1: Water-Saving Devices

FINDING: A significant percentage of the population we surveyed were not aware if they had water saving devices in their own home.

While creating our survey we wanted to be able to come up with some definite conclusions based off the answers we received. Because of this we were hesitant to include the "don't know" option on some of our questions such as "Do you have water-saving devices at home?". However our group found this option quite useful as it gave us an additional piece of information on the surveyed populations' sustainability habits. The results for the question are as followed on the pie chart below.

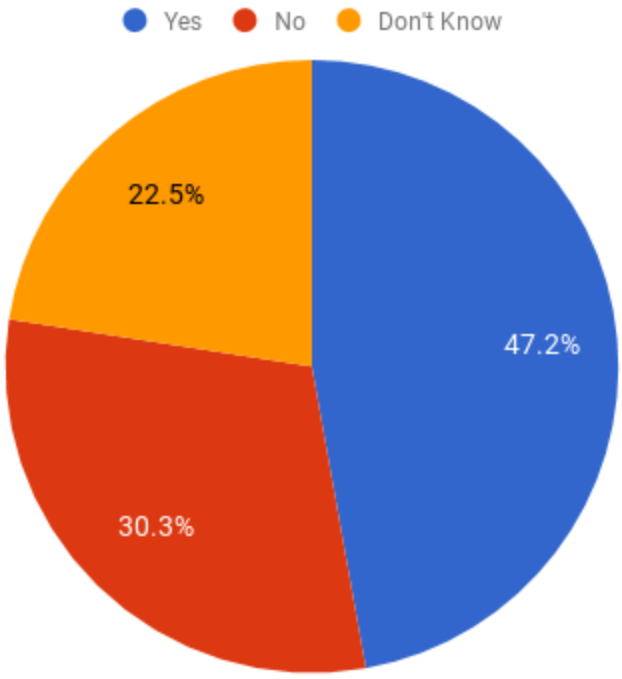


Figure 4.29

As we can see while 47.2% of the population said that they do have water-saving devices we cannot ignore that 22.5% of the population surveyed said they didn't know if they had these devices in their homes. This statistic can be seen in both a good light and a bad light depending on a person's point of view. On one hand it is an alarming statistic because many people would be wasting a larger amount of water than need be. People with these devices such as low flow shower and sink heads that aren't switched to that setting are doing themselves and the environment an unnecessary disservice. On the other hand it could be seen as a positive thing such as people not noticing the difference between a regular sink or shower head and a low-flow one. Our advisor Katy Boom stated, "Part of the reason people

might not be sure if they have these devices is because it would seem they do not notice a difference in the quality of water flow, which actually comes off as quite encouraging". Either way we seek to educate the population on these low flow devices as knowing is half the battle.

RECOMMENDATION: Have a specific activity or section to educate people on saving water and water saving devices during Go Green

As a result of the large percentage of don't know responses from our survey we recommend that Go Green Week has a specific section on water-saving devices. Either having an activity to educate citizens on water conservation or even a quick presentation on the topic would help educate the local population. Going off of that they should provide common examples of water-saving devices such as low-flow shower heads that would help people to recognize if they have the same items in their own homes. Furthermore, the presentation or activity should explain the benefits to having these devices including them being much better for the environment and overall more cost-efficient

4.5.2: Energy-saving Light Bulbs

FINDING: A high percentage of the population are unsure if they use Energy-saving light bulbs in their homes

Another type of technology that a large chunk of our surveyed population were unaware of was energy-saving light bulbs. These types of lightbulbs are often known LEDs (Light Emitting Diode) or CFLs (Compact Fluorescent Lights). They have grown quite common in recent years and are often talked about as being revolutionary for saving electricity. That is why it was shocking to see that almost a quarter of the population that our group surveyed were unaware as to whether they had these lightbulbs or not as can be seen below.

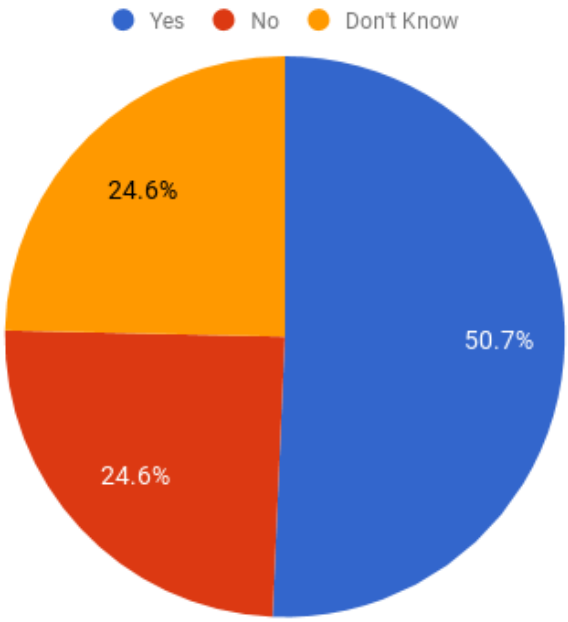


Figure 4.30

As we can see similar to the question on water-saving devices both a large percentage of the population surveyed did in fact have the technology but a significant percentage were not sure as to whether they had these energy-saving light bulbs. This is concerning because this shows that either people are unsure what to look on the labeling, or don't bother looking at it when purchasing light bulbs for their home. Traditional light bulbs tend to contain more harmful chemicals to the environment such as mercury. Alternatively energy saving light bulbs tend to have a much smaller amount of these chemicals as well as being able to last much thanks to the lower flow of electricity that can run through them. These light bulbs typically use between 25%-80% less energy than traditional light bulbs which can save locals money on electricity use (US Department of Energy, 2013). Another benefit it that these energy-saving light bulbs can last 3-25 times longer than traditional light bulbs so if people were to implement these lightbulbs they would already have saved money just through the investment. It is important to educate the population on energy-saving light bulbs because they are much more sustainable and they will also benefit the buyer (Ibid.).

RECOMMENDATION: Make education on energy-saving light bulbs a significant part of Go Green Week and openly advertise that they would save people money

Our group recommends that Go Green Week makes education on these energy-saving light bulbs a priority. The goal is to educate the people on saving electricity and what benefit it has. We also recommend that the fair talk about the bad sides of traditional light bulbs such as how improper disposal of these light bulbs can cause mercury pollution and how they use significantly more energy. A large point that should be made while educating the population on these devices is of how much money they would save if they actively looked for energy saving light bulbs like LEDs and CFLs. This will be a great way to influence people to make the purchase as saving money is a common theme that all people try to do regardless of income. Finally we recommend that the Go Green Week fair explain what to look for when attempting to purchase energy-saving bulbs. As mentioned before words like LED and CFL are common on light bulb packaging but having people actually examine the packaging will make it so they can actually know if they are using this technology or not.

4.6: Thermostat Education and Proactivity

FINDING: Most people that have programmable thermostat won't lower the temperature during cold months.

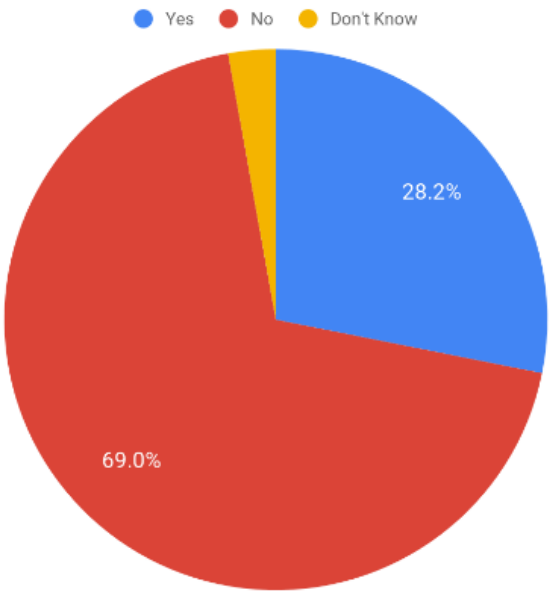


Figure 4.31

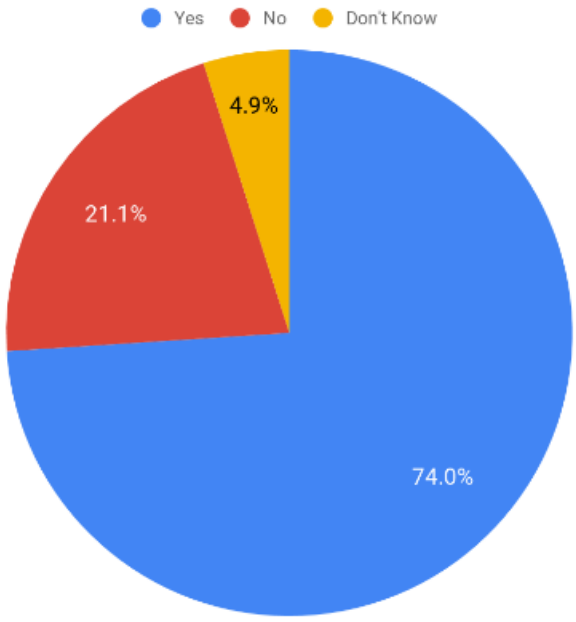


Figure 4.32

Another data point that surprised us during the analyzation was that while most people had a programmable thermostat at home only a fraction of them will lower the heat and put on an extra layer. This in turn means that an excessive amount of electricity each year is used on heating when there is a much more energy efficient solution. Our group found that the likely reasoning behind this is has to do with both education and effort. It is likely that many people who have programmable thermostats in their house are often unaware on how to use them properly. This, combined with the fact that the settings on these thermostats are often ignored by homeowners, means that people are wasting electricity and might not even realize it. The second reason we came up with for these results is that many people are not willing to sacrifice comfort in order to live more sustainably. Admittedly, putting on an extra layer and lowering the heat will not provide as comfortable a result as keeping the thermostat temperature high. That being said this results in more electricity being used and more money being wasted, both unsustainable habits. Investing in items such as sweaters or blankets will save much more electricity and money in the long run while providing somewhat similar results of comfort. We need people to realize that the high use of electricity for the heater is not sustainable for the environment nor themselves.

RECOMMENDATIONS: Provide an activity or presentation on excessive heat use during the winter. In addition try to involve local clothing stores in order to advertise wearing warm clothes as an alternative.

Our group recommends that we provide a way to educate the population on excessive heat use during the winter and how it plays a negative effect on sustainability. We want the population to know that there are other ways to stay warm during these months as opposed to leaving the thermostat on a high temperature throughout the season. We suggest talking about items such as sweatshirts and blankets and how just investing in these items will lower the amount of electricity and money that citizens are forced to use on staying warm. In addition to that it we believe it would be an interesting idea to try and get a local business that is involved in making sweatshirts, blankets, and other clothing items that can alternatively be used to keep people warm. If they were to directly be involved in Go Green Week it would benefit their own store, while helping us achieve our overall goal of educating Worcester citizens on living sustainably in everyday life.

Chapter 5: Conclusions and Reflections

Our project was to contribute to the Worcester City Go Green Week fair by being the first WPI group to be involved in the early stages and preparation of the event. Making Worcester a more sustainable city and educating locals on proper sustainable habits and initiatives is an important concept and goal of the Go Green Week event. Furthermore we contributed in part of the ongoing process of helping the City of Worcester reach its full potential to be one of the most sustainable cities in the country.

We were able to work effectively and in harmony thanks to the guidance and patience of the University of Worcester sustainability department headed by our sponsor Katy Boom, and her assistant director Matt Smith. We also worked closely with Worcester City Council member Warwick Neale, and sustainability department intern Duncan Bell. They were heavily involved in designing an effective survey instrument that would give us useful data on the sustainability habits of the Worcester citizens that we surveyed. We also would like to thank Worcester City Council members Rhizina Shearer, and Madeline Ajetunmobi, who attended the first stakeholders' meeting and helped us become more familiar with the concerns each party had. They also gave us some background of the sustainability levels in the city, as well as giving our group some clarification on our project that was not well known to us until we arrived in Worcester. Finally we want to give thanks to Andy Stevenson who offered us a step-by-step guideline on how to create the sustainability trail on google maps to show a route of all the local, sustainable businesses that both expressed interest in and committed to being involved in the upcoming Go Green week in the spring.

We realized that while our sponsors wanted to get slightly varying information out of the new, modified survey they also shared many common concerns about sustainable habits in the city. At our first meeting the main common concerns shared by all attendees was the excessive amount of littered cigarette butts and the amount of locals and tourists feeding the gull population. However, our project's focus then shifted to in-depth investigation of the sustainability habits of the locals. With this in mind we collectively worked together to create the best surveying instrument that would fit the needs of all parties involved.

5.1 Summary of Project Findings

Based on our experiences working on the Go Green Week project this past term we came up with some findings as well as two sets of recommendations for future groups. The general findings that we obtained were based off our own experiences during the project and are as follows:

- It is much easier to organize the 7-week long project if teams create a week to week schedule.
- We found it more time convenient and random if we surveyed at High St. rather than other locations.
- We got more responses if we gave out food to participants for taking our survey
- It is better to send businesses an email with a description of Go Green Week beforehand as opposed to just walking in and talking about it.
- We received more positive responses when we gave a short project pitch to store owners and employees about Go Green Week.
- Citizens were more receptive to taking our survey in its shortest version.
- Small businesses were more likely to get involved or donate to Go Green Week than larger ones.
- With regards to these findings we came up with several recommendations that would make completing the Go Green Week project easier and more efficient.

5.2 Recommendations for Go Green Week Groups

Upon completion of our project, and reviewing our findings, our group came up with two sets of recommendations. One set is the recommendations for the next Go Green Week group coming to Worcester in the spring while the other one is intended for the group coming in the fall of next year. Our recommendations for the next spring's group are as followed:

- Follow the timeline that our group created as a reference for scheduling the project. Our timeline is located in appendix A. This will help keep the group on a schedule and in turn will make sure there is less stress on the group towards the end of the term.

- Follow up with the local businesses that our group obtained during our 7 weeks in Worcester. These businesses are aware of Go Green Week as we've already talked to them and you'll want to let them know of your intentions for them as soon as possible.
- While surveying future groups should stick to High St. We recommend this because there is much more of a random sample of people located in the city center as well as that it is a much more time efficient area to survey at.
- Upon completion of Go Green Week try to start surveying the population as soon as possible. This is because in order to have the best data you need to have a large sample size of the population. We recommend using a survey on your phones as it is much easier than having to access internet with the tablets.
- When surveying people early in the morning, we recommend having either coffee or tea to give to people. This is because they will be more willing to take the survey if they just have to fill out a three minute survey and can get a drink rather than wait in line AND have to pay at a coffee shop. It is a win-win situation for your group and the person being surveyed.
- For the Go Green Week Team coming in the fall our recommendations are less about being time efficient and more having to do with how they can best do the preliminary work for Go Green Week. Our recommendations for their group are as followed:

Originally, we were asked to design a new survey to evaluate if citizens practiced sustainable habits in their everyday lives. In addition to this, we designed a few questions asking about how important sustainability and its principles were to citizens. Following the creation of the questionnaire, we piloted it and brought our results back to Katy Boom, at which point we were told to use the staff and student survey questions as the foundation to our questionnaire instead. Our sponsor wanted us to take components of these surveys and implement them into our own survey so that could be effectively given to the general Worcester population. We would have gone about creating a structured questionnaire differently, as we believed that starting from scratch would allow us to design more accurate

questions in relation to Go Green Week. Furthermore the two previous surveys were designed for students and staff so the questions wouldn't pertain to most locals. The staff and student surveys from last spring restricted us due to their excessive length and lack of content relating to Go Green Week and general sustainable principles. Therefore, we recommend the survey be primarily designed by the inclusion of questions evaluating citizens' sustainable habits and their perceived importance of sustainability, rather than being restricted to basing the survey design off of previous ones.

When first meeting with the stakeholders of the project make sure that the objectives and goals for the project are clear. You don't want to waste anytime sitting around and wondering what you should do for the project if the group is unsure. Ask Katy directly what work she is looking to get out of your team while in Worcester

We recommend that you go into the City Center early on and scout out some of the stores that you believe could be attracted to Go Green Week. Just by having a quick look around the city it will be much more helpful than going in and not knowing any of the stores in the area. Also look for stores that advertise words in their logos or windows such as local, green, fresh, etc. We believe these stores would be much more inclined to donate or participate.

Look for smaller businesses when scouting out the city. Many larger businesses tend to either already donate to set charities or cannot get involved with an event like Go Green week due to corporate restrictions

Do not be afraid to voice your opinions when meeting with the sustainability department or when meeting with stakeholders. Your team is a part of the project too and therefore you have the right to speak up when you have an idea that might be clever or you believe an idea or opinion from another party is far-fetched. While your sponsor has the final word on the direction the project goes in, they will respect a second opinion and will take it into account.

Ask businesses if there is a specific description of their business that they would like included on the topic of sustainability for their google maps pin location. This will serve as another benefit for businesses for being involved in Go Green Week as they can pick exactly what part of their business they would like to advertise.

In conclusion our project helped to expand upon the Go Green Week model by helping to divide the work into two terms and between two teams in order to produce the best and most successful Go Green Week fair possible. We hope that the work we provided will help the Spring Go Green Week team fully focus on the event as well as work with peace of mind. We wanted to eliminate as much stress for them as possible by completing much of the preliminary work for Go Green Week. Hopefully by having each team focus solely on ½ of the project we can maximize the influence that Go Green Week has which will in turn lead the city of Worcester to reach its sustainable peak and become an example for other cities to follow by example.

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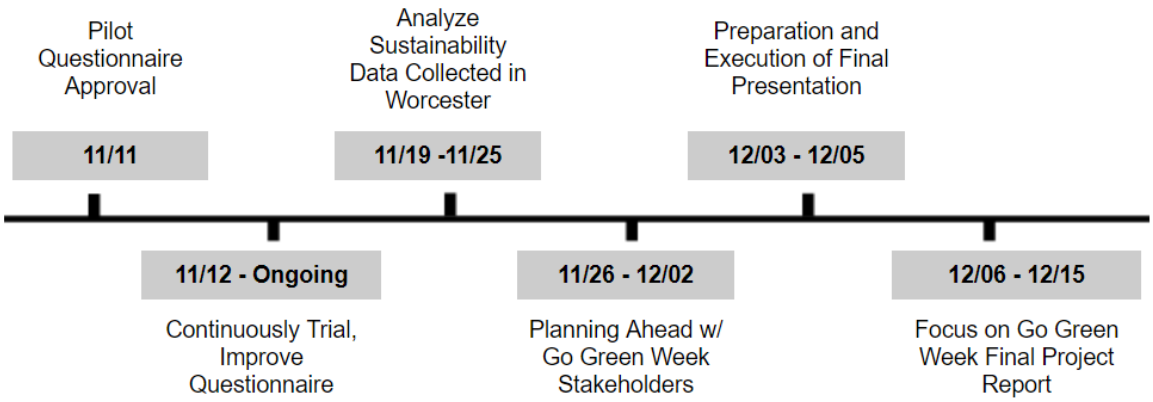
Appendix A: Week by Week Schedule for B' term Go Green Week Team



Appendix B: Alternative Recommended Schedule for Spring GGW

Appendix C: Original Survey Questionnaire

1. What is your…

Age?
Gender?
Highest level of education?
Postcode district?

2. In your home, when turning off the tap, would you say that you:

a. Always check that the water flow has fully stopped?
b. Sometimes check that the water flow has fully stopped?
c. Not often check that the water flow has fully stopped?
d. Never check that the water flow has fully stopped?

3. How do you most commonly get around?

a. Car by myself
b. Car with others
c. Public transportation (train or bus).
d. A bicycle
e. walking

4. How many of the following actions have you taken in the past year?

Donating unwanted clothing to the British Heart Foundation
Choosing to reduce energy usage in your home (e.g. lowering thermostat in winter)
Buying something secondhand from a charity shop or website such as eBay
Choosing to drive less to get around
Attended a local event concerned with sustainability or the environment

5. How many of the following do you have in your home?

Recycling bin
Smart heating (able to be controlled from a tablet)
Electric clothes dryer
Motion sensor lights
Low-Flow Shower Heads

6. When binning a recyclable, do you generally

Always make sure to find the correct bin (e.g. hold on to a Coke bottle until you spot a bottle recycling bin)?
Try to find the correct bin but use the wrong one if it can't be found?
Throw it in the first available bin?

7. On a scale from 1(lowest) to 4(highest), how committed are you being sustainable?

1 2 3 4

8. During the last year, how often did you…

8.1 Turn off the lights when leaving a room?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.2 Switch off electrical appliances when not in use?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.3 Set the thermostat to 18 degrees or lower in winter?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.4 Print double-sided to save paper?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.5 Operate washing machine only when you have a full load of clothes?

a. always/often
b. Sometimes
c. Rarely
d. Never

e. N/A

8.6 Limit time spent in the shower?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.7 Use a reusable water bottle, coffee cup, travel mug, etc.?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.8 Shop for items with minimal packaging?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.9 Donate unwanted items, e.g. using the British Heart Foundation donation banks?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

8.10 Repair a broken item or visit a local Repair Cafe?

a. always/often
b. Sometimes
c. Rarely
d. Never
e. N/A

f.
g.

Appendix D: Letter to Businesses

Hello Worcester Resource Exchange Team!

We are students from the United States working with the University of Worcester on a sustainability study in the city of Worcester, UK. We want to highlight small businesses in the area working on being "green" or environmentally friendly through the use of a *Google Maps* route we are creating that shows consumers shopping in the area of where these businesses are.

In addition to the *Google Maps* green marketing initiative, we hope to gain you as a business contact that can be a resource outlet for Go Green Week, a joint event between Worcester City Council and the University of Worcester. This sustainability awareness-raising event is designed to show sustainable habits to citizens of Worcester that they can adopt into their everyday lives.

The event is taking place in April, which is far off from now, however we are currently collecting contact information of individuals within local businesses that are willing to get involved. We will be coming by to visit you tomorrow to discuss in person who we should keep in contact with for the spring event. Thank you for your time and consideration, and we hope you will be interested in working with us, the University of Worcester, and the Worcester City Council on improving sustainability in the Worcester community!

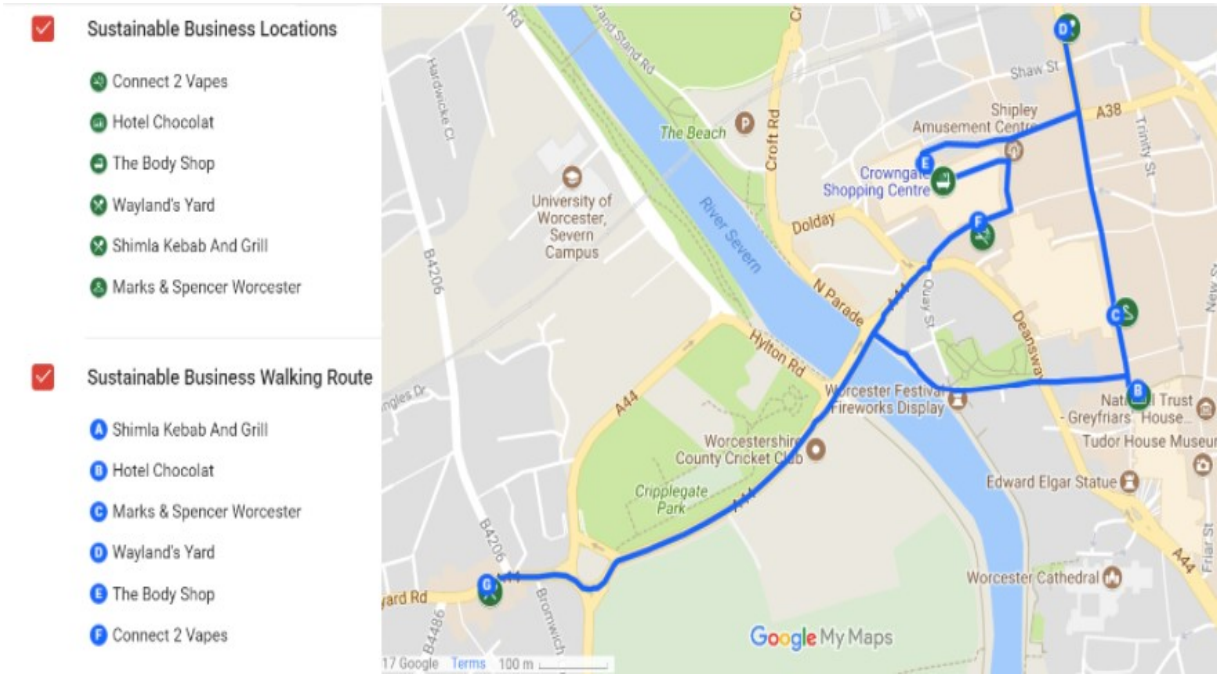
Sincerely,
The "Go Green Week" Team
Stephen Burke, Max Marks, and Adam Camilli

Appendix E: Keys to Approaching Local Businesses

- Scout businesses in the city that would likely be interested in being involved with Go Green Week
    - Look for businesses that have the words “local, organic, GMO free, etc.”
    - Research which businesses were involved in previous years and attempt to persuade them to do it again
- Send out a preliminary email that can be sent to either a manager or the businesses email
    - This can be a generic letter that gets your pitch across
    - If they do not offer an email on their websites you can often call them
    - Do not be discouraged if they do not respond, if this is the case you are going to have to talk to employees in person
- Additionally any local restaurants or stores that the group or an individual has a good relationship with would more likely be willing to participate
- Have a pitch to give that is similar but also unique as compared to your email
    - This makes the project sound much more organized and intriguing
    - It also makes you sound much more passionate which can influence businesses to be more willing to participate
- Go into the business and approach whichever employee is at the front desk or checkout
    - A manager or store owner would be best but most of the employees are willing to give out contact information

- DO NOT make your pitch sound like you are trying to get the business to donate money, this is an instant turnoff for many businesses (if said too early on).
- Look presentable, raggedy clothing, poor hygiene, and unkempt hair are also a big turnoff to these local businesses and can make you come off as dodgy
- Be friendly and always have a smile on your face when talking to an employee
- The conversation with an employee or store owner should not feel forced it should be very free flowing and if you can get them in a good mood it will skyrocket your chances of them being interested in the project.
- Let them know the benefits of being put on the google maps path and how it can bring them good publicity
- Do not get angry or discouraged if a business declines to be involved with Go Green Week, many of these businesses have charities they already donate to already so it is possible they will say no to being involved.

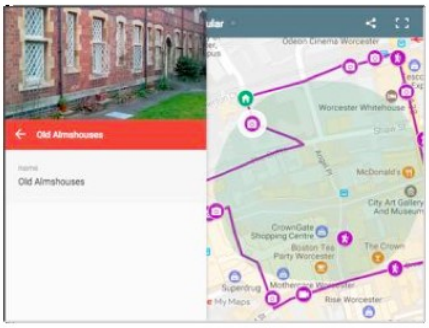
Appendix F: Google Maps Trail



A Beginner's Guide to Creating An Interactive Google Map.
Andy Stevenson, Senior Lecturer in Design, 2017

Overview
Google maps now provide an amazing offering in terms of powerful interactive maps that you as a Google account member (it's free to join) can use to create your own interactive Google maps. These maps can then be used and shared for all manner of scenarios including: embedding in a blog or social media as part of a creative project and also an additional 'offer' to clients if you create web pages or 'Wordpress' sites.

***Note** - Here's a screen shot of a simple sample interactive Google map:*



On this you can see:

1. (On left) the feature area – this can be a picture you've taken or a scan of a sketch you've created or even a link to a YouTube video or similar.
2. (On right) the interactive map area. This shows (in this example) a walking route around the city of Worcester and various 'key points' marked her as either a camera pictogram, video pictogram or walking person.

Try it out for yourself:
Click [here] to look at a copy of this map in a web browser. Try clicking on the various purple key points to reveal the different linked media in the feature area. Dependent on how you view this map (i.e. on a phone or a laptop/desktop machine) this may work slightly differently but you should always be able to explore the various aspects of the map whatever the viewing media/method.

Where to start..

1. Make sure that you've signed-up for free to Google. They'll allot you an account and an e-mail address (you also get loads of Google Drive space to use too!). [Click here].
2. Now complete the various fields in the online form and follow the signup pages as they take you through so that you can create your new account.
3. Once complete, make sure that you're logged-in and then click the little grey 'grid' pictogram which should appear in the top right of your Google screen.

Appendix G: Final Survey

1. **Do you have any of the following at home?**

    1.1 Recycling bins

    Yes No Don't Know

    1.2 Compost bins

    Yes No Don't Know

    1.3 Recycling information posts

    Yes No Don't Know

    1.4 Programmable thermostats e.g. app that sets the time and temperature of your boiler

    Yes No Don't Know

    1.5 Water-saving items e.g.(low-flow shower heads)

    Yes No Don't Know

    1.6 Light motion sensors

    Yes No Don't Know

    1.7 Energy-saving light bulbs

    Yes No Don't Know

    1.8 Renewable energy systems, e.g. (solar)

    Yes No Don't Know

2. Have you participated in any of the following activities over the past 6 months?

    2.1 Litter picks

    Yes No Not Sure

    2.2 Clothing donations

    Yes No Not Sure

    2.3 Growing vegetables

Yes No Not Sure

2.4 Using public transport

Yes No Not Sure

2.5 Buying secondhand

Yes No Not Sure

2.6 Volunteering in the community

Yes No Not Sure

3. How often have you done the following in the past 6 months?

3.1 Turning off lights when leaving a room

Always Sometimes Rarely Never N/A

3.2 Switch off electrical devices when not in use

Always Sometimes Rarely Never N/A

3.3 Set heat to 18 degrees of lower during cold months

Always Sometimes Rarely Never N/A

3.4 Operate washing machine only when you have a full load

Always Sometimes Rarely Never N/A

3.5 Limit time spent in the shower

Always Sometimes Rarely Never N/A

3.6 Check recycling labels before selecting proper waste bin

Always Sometimes Rarely Never N/A

3.7 Repair broken item/visit a local repair cafe

Always Sometimes Rarely Never N/A

4. Of Worcester's Ten "Golden Rules", which of the following habits do you practice in everyday life?

4.1 Drink tap water/use a fountain

Yes No Not Sure

4.2 Use active transport (e.g. walk, cycle, take the stairs)

Yes No Not Sure

4.3 Reduce paper use

Yes No Not Sure

4.4 Eat more locally grown fruits and vegetables

Yes No Not Sure

4.5 Turn off electrical devices and lights when not in use

Yes No Not Sure

4.6 Turn down the thermostat and wear and extra layer

Yes No Not Sure

4.7 Use your own mug, not disposables

Yes No Not Sure

4.8 Hold video conferences and skype calls as an alternative to traveling to meetings

Yes No Not Sure

4.9 Only fill the kettle with enough water for the number of cups you are making

Yes No Not Sure

4.10 Borrow/share with someone who already owns an item rather than buying your own (e.g. a lawnmower)

Yes No Not Sure

5. About you

5.1 Gender

Male Female Prefer not to say

5.2 Age

Under 25 25-34 35-44 45-54 55-64 65 or older

6. What is your postcode district? (The district is the first three characters e.g. “WR2”)

7. What is your highest level of education?

High School Further Education Higher Education

Appendix H: 10 Golden Rules of Sustainability

10 Golden Rules

Living Sustainably at the University of Worcester

1) Drink tap water

2) Use active transport: walk, cycle and use the stairs rather than lifts

3) Reduce paper use: double sided photocopying, re-use scrap paper, don't re-print emails and other documents unless absolutely necessary, hold paperless meetings

4) Eat more fruit and veg locally produced and minimally processed

5) Turn off lights, computers, chargers etc when not in use

6) Turn down the thermostat and wear an extra layer

7) Use your own mug, not disposable mugs

8) Hold video conferences rather than asking people to travel to meetings

9) Only fill the kettle with enough water for the number of cups you are making

10) Think before you buy: do you need it or can you share it?

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Appendix I: Notes from First Meeting with Stakeholders

10/23 Meeting Notes

Prof. Boom and Krueger:

- Proposal was not focused: Every section must start with a broad overview that is then narrowed down to specific methodologies and statements.
- Worcester has two-tier local govt system: One county, twelve districts.
    - Worcester**shire** County Council controls interdistrict stuff like motorways.
        - For example, what we can and cannot collect for refuse.
    - Worcester City Council controls more local matters.
    - Elections result in somewhat short-term decision making.
        - Particularly in Worcester City, since not all elections are held at the same time.
        - Worcester and Worcestershire County are currently run by Conservative party, but they have made a deal with green associations.
- Proposal made way too many bold statements without evidence or especially credible sources.
    - Must base any bold claims on **gold-standard sources** (Peer-Reviewed Academic Literature)
- We did not distinguish between Go Green Week on Worcester University campus and Go Green Week in the city.
    - Last year was the first time it was done in **Worcester city,** has been done on Worcester University campus for about a decade.
- Stakeholders showing up today:
    - Madeleine, Rezina
        - Colleagues on Worcester City council who have been working on their own project
        - Hospitable to sustainability
        - “feed the 1000” event which was about highlighting the amount of waste of UK food. Was her 700-quid budget that did it (to pay for external caterers)
            - Did this cheaper by using catering students and obtaining food from grocery stores
        - Works for behavior change around waste
    - Worcester BID: Gov’t organization to help localities promote their local businesses
        - Their goal is to get people to boost Worcester’s economy by shopping there.
- Worcester City is fairly litter-free: Prof. Boom has students who do litter picks.
    - This is a crucial part of Go Green Week event on campus.
    - Helps to improve local perception of students who can be seen as nuisances

Meeting with Stakeholders:

- Rezina – Community Partnership Officer. Essentially ensures those provided with grants by the city spend the grants on what they were supposed to spend it on.

- Easy goal: Several coffee chains in city use black plastic coffee lids. These can't be recycled, therefore there really is no reason they couldn't flip them for actually recyclable lids.
- Boom and Smith have been measuring the attitudes and awareness of their colleagues of sustainability.
- Bayliss: A key politician who is very engaged on GGW.
    - They piled around 16 questions last year while working with U. of Michigan and got good data off of them.
    - We need to distill these questions into the most easily digestible form possible for the general population.
        - Rezina: Last year recyclable bins were almost always contaminated with waste.
            - Perhaps recyclable bins should be more obvious
    - Katy Boom: Last year's team did not ask the right questions.
        - Last year's group offering entertainment to children made parents a lot more receptive to answering questionnaires
        - Apr 16th - 21st
        - Katy wants to more work with Mark's and Spencer's
            - One of the most sustainable businesses in UK