

Learning Sustainably: Curriculum, Recipes, and Waste Signage for Ypsilanti District Library

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Ypsilanti District Library
Graham Sustainability Scholars Final Report
2024

Executive Summary

The Ypsilanti District Library (YDL) has a long and successful history of providing informal education to the residents of Ypsilanti, MI. With three distinct branch locations, the YDL system oversees a variety of programming events for all ages and delivers key services and resources to the local community. Our team collaborated with the YDL to incorporate sustainable practices and educational opportunities into summer programming by developing three types of deliverables:

To complete our first deliverable, we created three STEM lesson plans, each representing a different environmental theme, that could be incorporated into the YDL's annual "Summer Challenge." The lesson topics included water filtration, backyard birding, and upcycling with homemade shrinky dinks. For each lesson we developed a comprehensive facilitator guide, worksheets tailored to each individual lesson, and supply lists so that the programming could be continued into the future with any YDL staff. We conducted a test run of our water filtration activity, which allowed us to improve aspects of the lessons' setup and facilitation techniques prior to the Summer Challenge launch.

For our second deliverable, we created and tested five vegetarian recipes that each featured at least one ingredient grown in library gardens. The recipes are relatively easy to prepare and require minimal kitchen appliances, thus making them accessible to wide audiences. We also designed recipe handouts using Canva so that they could be used in YDL cooking programs or distributed at any library branch or via online platforms.

Our final deliverable was to create signage to promote proper waste disposal. Our team created signage directing patrons who attend the library's summer lunch program where to place compost, recycling, and trash for proper disposal, and any unopened food for redistribution. The signage included recycling information specific to Ypsilanti and incorporated visual icons so that young children could understand where to dispose of each type of waste.

Although our programming and lessons could be improved by better catering to large audiences, we anticipate our deliverables to improve sustainable practices in waste management at the library and to engage children in Ypsilanti with STEM and sustainability-based programs.

Introduction and Background

This project partnered with the Ypsilanti District Library (YDL) to develop sustainability-related curriculum, easy recipes to accompany a community garden, and waste signage to facilitate proper waste disposal during library events. The YDL consists of three branches that serve different segments of the community: the Whittaker branch, the Superior branch, and the Michigan Ave branch. Each of the three branches provide informal education opportunities to the residents of the City of Ypsilanti, Ypsilanti Township, and some of Superior Township, MI. Informal education includes any learning that occurs in the 86.7% of time a child spends outside of a classroom, and it can increase positive feelings towards learning, teach new concepts within STEM, allow children to socialize, and provide needed educational resources to underrepresented populations (Denson et al., 2015). Informal education therefore acts as a crucial and accessible tool in enabling children to learn about sustainability and how it relates to their lives.

YDL's three branch system allows for curriculum to be tailored to the needs of residents within their area. For example, the Whittaker branch acts as the main hub for the library and has the most space for large events tailored to a wide array of demographics. The Superior branch is smaller, but is built in a lower-income area and thus prioritizes providing work spaces, hands-on activities, and additional resources to support learning. The Michigan branch was undergoing repairs throughout the duration of our project and will not be elaborated on here.

Each year, the YDL administers the "Summer Challenge," in which library patrons read, complete tasks, and attend library programming events to collect achievement badges and prizes (Ypsilanti District Library, Summer Challenge). In order to provide new and exciting learning opportunities to visitors of both branches, we aimed to develop three new sustainability and STEM related programs that could be catered to either branch and incorporated into the Summer Challenge. These programs would be used over the summer or throughout the school year during family events, or made available as passive learning bins that could be explored in a visitor's own time.

All three branches additionally have educational community gardens that provide food to the community and teach visitors how to grow their own produce. The Superior and Michigan branches both provide "Garden-to-Table" events where visitors learn to cook with garden produce during an on-site class. At the Whittaker branch, Garden-to-Table events are not part of the regular programming, and so the community garden is open for patrons to take whatever produce they desire. In order to provide further resources for these events, we were tasked with developing family-friendly recipes using vegetables, fruits, and herbs grown in the gardens.

Visitors could then use the Seed Library at the Superior branch to grow some of their own produce that they used in the recipes, further promoting the use of local food sources.

Our final task was to create waste signage to encourage proper waste disposal during summer lunch programs. This signage would be child-friendly and show which bins each kind of waste should go into. We hoped the signage would increase the amount of waste diverted from landfills to recycling and compost and reduce the amount of errors in disposal, making YDL's waste management easier and more sustainable.

Methods

Our first actions in collaboration with the YDL included meetings with YDL staff and site visits to the Whittaker and Superior branches. We sought to understand the needs of the library and its patrons, particularly how those needs differed between locations. We surveyed the YDL's event spaces and waste disposal methods, and we observed a youth programming event. We also toured the library gardens at both locations and identified which plants are successfully grown during the summer. We discussed the details of YDL's desired deliverables and how they fit into the library's sustainability and community development goals. After the initial site visit, we met monthly with Jodi Krahnke, Head of Youth Services, regarding our progress and changes in library needs.

For each STEM lesson we developed a facilitator guide, worksheets tailored to each individual lesson, and supply lists. Our goal was to create comprehensive resources to allow the library staff to continue using these lessons throughout the year and into future summer programs. Prior to the library's Summer Challenge launch, we conducted a test run of our water filtration activity at the Whittaker location in late March. This trial run allowed our team to optimize setup, adjust material needs, refine facilitation techniques, and have a better understanding of how the library conducts its programming.

To support our Backyard Birding lesson, we held external Zoom meetings with Victor Chen, the Education Chair of the Washtenaw Bird and Nature Alliance. During these sessions, we discussed effective teaching methods, safe foods for birds, and the species most likely to be observed at each library location. Victor also provided resources for further information and tools specifically designed for child education. For our Shrinky Dink lesson on recycling, we gathered information on materials that can be recycled in Ypsilanti, and developed content on the importance of recycling and waste management. All information was presented in an age-appropriate way, allowing children to understand and engage with concepts related to sustainability and environmental responsibility.

After determining which plants would be grown in YDL's gardens the following summer, we developed five vegetarian recipe ideas featuring at least one garden product. We tested and edited the recipes at home and used Canva to design ready-to-print recipe handouts.

Our first step in creating waste signage was to identify where, when, and how the library planned to use the signage. Jodi specifically requested printable signage that could be posted above waste bins, informing patrons where to dispose of their waste. The signage was to be used during the summer lunch programs hosted by the Whittaker and Superior branches. Although we had preexisting knowledge of good recycling and composting practices, we researched waste disposal guidelines specific to the city of Ypsilanti (City of Ypsilanti, Materials Accepted Curbside). After research, we used Canva to design informational signs to be placed above recycling, compost, trash bins. The designs were partially inspired by Washtenaw County's Zero Waste Event signage. We targeted younger age groups by including visual graphics.

Deliverables

Our project with the YDL focused on creating engaging, hands-on educational programs to connect children with environmental topics. We designed three programs tailored to teach kids about local ecology and sustainability: Backyard Birding, DIY Water Filtration, and Shrinky Dink Recycling. Each program included worksheets and instructions to ensure smooth execution and flexibility for different group sizes (Figures 1, 2, & 3 in Appendix). We designed the programs to make environmental education accessible and enjoyable, empowering young participants with knowledge and hands-on experiences in conservation and sustainability.

The Backyard Birding activity introduced kids to local bird species, fostering an appreciation for urban wildlife. We developed a facilitator guide that provided a comprehensive materials list and lesson plan adaptable for small (six participants) and large groups (thirty participants). The lesson encouraged children to observe and learn about birds they might see at home, and included a take-home birdseed ornament to reinforce the experience. Participants use birdseed, gelatin, and molds to make the ornament and answer discussion questions while waiting for the materials to set. A passive activity bin was also created for the Superior branch that allowed participants to learn about and watch birds in their own time. The bin included binoculars, bird identification guides, a bird anatomy puzzle, and other worksheet handouts to encourage independent learning.

The DIY Water Filtration lesson offered hands-on experience with water quality and conservation, helping children understand basic filtration practices. This program required more extensive planning, including presentation slides to explain the function of each filtration material and examples of large-scale water treatment plants. During the lesson, young library patrons had the opportunity to build their own water filter in a recycled water bottle using sand, gravel, and activated charcoal. To deepen engagement, we designed an interactive worksheet prompting kids to observe and record the filter's effects on water and consider questions like, "Do you think the filter works better when it filters slowly or quickly?" The facilitator guide provided a detailed supplies list, preparation steps, and reference images.

The Shrinky Dink activity aimed to promote recycling awareness in a fun and creative way. During this activity, kids were encouraged to trace, color, cut out, and bake old plastic to create a personal and durable keychain. This program included a worksheet explaining the significance of recycling, along with information about what can be recycled in Ypsilanti. To make the activity accessible to different ages, we included stencils on the reverse side, ranging from simple to intricate designs. Additionally we included questions on the facilitator document such as, "What things are made of plastic?" and "How can we reduce plastic waste?" These prompts are intended to deepen their understanding of plastic use in daily life, waste management practices, and the importance of recycling.

We developed five recipes to be used or distributed by the YDL: salsa, strawberry pie filling, green goddess dressing, lemon-herb dressing, and basil vinaigrette (Figure 4). In total, these recipes call for eleven ingredients available in the YDL summer gardens. Featured ingredients include tomato, jalapeño, onion, strawberries, cilantro, chives, parsley, dill, rosemary, and thyme. All recipes are vegetarian, require few additional ingredients, and can be made using typical home appliances. Using Canva, the recipes were designed so that they can easily be printed and distributed at any branch location. However, they can also be adapted for use in the Michigan Ave. and Superior branch Garden-to-Table programming events where library patrons cook a meal on-site during a staff-led lesson.

We also developed signage for trash, recycling, and compost bins to be used during the YDL's summer lunch programs (Figure 5 in Appendix). Each sign uses written instructions and visual graphics to indicate what can be included in each method of disposal. The signs should be posted directly above the designated bin. The recycling sign includes specific information about which plastic numbers are recyclable in Ypsilanti. We also created signage for a "Share Table" where patrons could leave or take unopened food items (Figure 6 in Appendix).

Recommendations

Based on our experiences, we recommend to future Graham Scholars who are creating lesson plans to consider the venue (indoor or outdoor) and audience size. The Backyard Birding lesson underscored the importance of these factors. We encountered challenges with setting and drying the birdseed ornaments during outdoor summer programming. Due to the high temperatures, the gelatin mixture was unable to set properly which required library staff and volunteers to stay after the event had concluded to ensure the children who participated would be able to take the ornaments home. If this lesson were used again, we strongly recommend it to be indoors where the temperature is controlled. In addition, we recommend altering the program lessons depending on the audience size. We found that accompanying worksheets are not very effective when interacting with large audiences. The handouts are often ignored and it is difficult to follow up on questions presented in the worksheets. When many people are expected to attend a programming event, we suggest going through some questions as a group before the activity starts. This problem could also be alleviated by changing the programming structure to include multiple stations. That way, the audience could be split up into smaller groups that interact more with library teaching staff.

All of programming can easily be expanded upon or incorporated into larger themed lessons. For example, previous Graham Scholars groups developed “upcycling” themed programming that could easily be updated to include the shrinky dink activity. We also suggest that the water filtration lesson could be broadened to an overall theme of water quality and be presented with more themed activities that included the use of Whittaker’s pond.

Impact

Our project’s deliverables seek to bolster sustainability education within Ypsilanti and provide educational tools to YDL visitors. Over the summer of 2024, the Ypsilanti library used our Water Filtration and Backyard Birding lesson plans for several curriculum events. Families were able to learn together through these events and seemed to enjoy the hands-on activities. These lessons are a good first step in promoting sustainability and how it affects our everyday lives. The Shrinky Dinks Recycling activity, alongside the recipes and waste signage, were not

implemented over the summer, but the instructions and deliverables we have provided should allow for easy utilization at any time in the future. Implementation of the additional lesson plan and recipes this year will encourage visitors to engage further in hands-on activities related to sustainability. When the waste signage is used, it will hopefully reduce errors in waste disposal and encourage children to share any unopened food instead of throwing it away. This would create a more sustainable waste system during summer lunch programs.

In the long term, we hope our deliverables will inspire further elaboration on sustainability programming, community garden usage, and sustainable waste management within the YDL. Our deliverables can be used as blueprints for future lessons and recipes that will continue to keep informal education at the library fresh and exciting. We hope our waste signage can be applied to other aspects of the YDL's operations so that they can continue to improve their waste sustainability. We also hope future teams can build upon our work and continue to foster curiosity around STEM and sustainability throughout the YDL community.

Acknowledgements

First and foremost, we would like to thank our key contact at the YDL, Jodi Krahnke, who met with us regularly throughout the year and guided our work. We also would like to thank Stephanie Pocsi-Morrison, Nicole Russell, and Mary Garboden from the YDL who worked in collaboration with our team throughout our project, and the duration of the summer internship.

From the Graham Sustainability Institute, we would like to thank Bridget Gruber, Lauren Furey, and Megan McLaughlin for their unwavering support and recommendations over the past year and a half. We also would like to acknowledge our previous team member, Gaby Scott, who provided crucial contributions to the early stages of our project.

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Appendix


FUN WITH FILTRATION!

Materials

- One liter bottle, cut in 2 pieces
- 1 piece of cloth
- 1 rubber band
- Large gravel
- Sand
- Activated charcoal
- Contaminated water


Instructions

- 1) Use the rubber band and cloth to seal the top of the bottle
- 2) Flip the top part of the bottle upside down and place it in the bottom part of the bottle. Refer to photo.
- 3) Place the sand in the bottleneck, followed by the activated charcoal, more sand, and then large gravel. There should be 4 distinct layers in the upside down bottle top.
- 4) Pour contaminated water through the filter and compare colors before and after to decide if the filter worked



FUN WITH FILTRATION!

GRAVEL	SAND	CHARCOAL	CLOTH
Removes large debris	Removes small debris	Removes chemicals and toxins	Removes any remaining small particles

Did the water color change after going through the filter? 

Why shouldn't we drink the water we filtered?

Do you think that the filter is working better when it filters slowly or quickly?

Figure 1. Fun With Filtration Worksheet

Backyard Birding



American Robin
Orange or reddish bellies, brown backs, yellow beaks, and black heads with white around the eyes.

American Goldfinch
Yellow bird with black and white wings, orange cone shaped beak.

BlueJay
Bright blue in color with a black and white face. Pointy beak usually dark gray or black.

Match the bird to the name!



American Robin

I eat lots of bugs but I like seeds too!



American Goldfinch

I eat mostly seeds, but sometimes bugs!



BlueJay

I eat seeds, bugs, and berries!

Figure 2. Backyard Birding Worksheet

Shrinky Dink Keychains!

Turning old trash into new things is a fun and creative way to help the environment. Did you know the world produces more than 400 MILLION TONS of plastic waste each year? (unep.org) By using items we might normally throw away, like plastic containers, we can reduce waste and create something beautiful and creative!



What can I recycle in Ypsilanti, Michigan?

- Plastic bottles and containers #1, #2, & #5
- Aluminum and steel cans
- Cartons
- Glass bottles and jars
- Cardboard
- Newspaper, junk mail, paper

Materials

- #6 Plastic
- Hole Puncher
- Sharpies
- Key Ring
- Baking Pan
- Tin Foil

Instructions

- Pick a shape of #6 plastic
- Using a hole puncher, make a hole in your plastic near the top. This is where you will put in the key ring!
- Use a sharpie marker to draw and color on only one side of the plastic
- Put your colored piece of plastic on the baking sheet covered with tin foil
- Bake for 2-3 minutes at 325 degrees
- Let cool and put the key ring in the hole!

Trace or Create Your Own!



Figure 3. Shrinky Dink Keychain Worksheet

EASY SALSA

WITH INGREDIENTS FROM OUR GARDEN!!

Ingredients

- 3 medium-sized tomatoes
- ½ small onion
- 1 jalapeño (add more or less depending on spice preference)
- 1 lime, juiced
- ½ bunch cilantro (about ¼ cup when finely chopped)
- ½ tsp salt
- ½ tsp cumin
- ½ tsp garlic powder

Directions

1. Harvest the tomatoes, jalapeños, cilantro, and onion from the library garden, if available
2. Finely chop the tomatoes, onion, jalapeño, and cilantro. Juice limes.
3. Combine all ingredients in a large bowl and stir until fully mixed
4. Serve salsa with tortilla chips

EASY STRAWBERRY PIE FILLING

INGREDIENTS

- 2 CUPS STRAWBERRIES
- 1/4 CUP SUGAR
- 1 TBSP LEMON JUICE
- 1 1/2 TBSP CORNSTARCH

DIRECTIONS

1. HARVEST STRAWBERRIES FROM THE LIBRARY GARDEN, IF AVAILABLE. RINSE AND CUT INTO QUARTERS
2. ADD STRAWBERRIES, SUGAR, AND LEMON JUICE TO A SMALL SAUCEPAN. SIMMER OVER LOW HEAT UNTIL THE STRAWBERRIES BECOME SOFT (ABOUT 20 MINUTES)
3. SLOWLY MIX IN THE CORNSTARCH, THE TEXTURE SHOULD BE LIKE TO LUMPY JAM
4. TAKE PAN OFF HEAT AND LET COOL

3 Summer Salad Dressings

Green Goddess

- 1 CUP GREEK YOGURT
- 1 CUP PARSLEY
- ½ CUP DILL
- ½ CUP CILANTRO
- 2 TBSP CHIVES
- 1 TBSP LEMON JUICE
- 1 TBSP OLIVE OIL
- 1 GARLIC CLOVE
- ½ TSP SALT
- BLACK PEPPER TO TASTE

1. GATHER PARSLEY, DILL, CILANTRO, AND CHIVES FROM THE LIBRARY GARDEN, IF AVAILABLE
2. COMBINE ALL INGREDIENTS IN A FOOD PROCESSOR AND BLEND UNTIL SMOOTH
3. STORE IN A REFRIGERATED, SEALED CONTAINER FOR UP TO ONE WEEK

Basil Vinaigrette

- 1 CUP BASIL LEAVES
- ½ CUP OLIVE OIL
- ¼ CUP APPLE CIDER VINEGAR
- 1 CLOVE GARLIC
- 2 TBSP HONEY
- ½ TSP SALT
- ½ TSP BLACK PEPPER

1. GATHER BASIL FROM THE LIBRARY GARDEN
2. COMBINE ALL INGREDIENTS IN A FOOD PROCESSOR AND BLEND UNTIL SMOOTH
3. STORE IN A REFRIGERATED, SEALED CONTAINER FOR UP TO ONE WEEK

LEMON-HERB

- 1 CUP LEMON JUICE
- ½ CUP OLIVE OIL
- ¼ CUP HONEY
- 2 TBSP DILL
- MUSTARD
- ¼ ONION, MINCED
- 1 TBSP THYME
- ¼ TSP ROSEMARY
- ½ TSP SALT
- BLACK PEPPER, TO TASTE

1. GATHER THYME, ROSEMARY, AND ONION FROM THE LIBRARY GARDEN
2. FINELY MINCE THE ONION, THYME AND ROSEMARY
3. COMBINE ALL INGREDIENTS
4. WHISK OR SHAKE TO COMBINE
5. STORE IN A REFRIGERATED, SEALED CONTAINER FOR UP TO ONE WEEK

Figure 4. Final recipe handouts



Figure 5. Waste signage



Figure 6. Share Table signage