Rain Garden Development for Educators & Farmers

Design, Install, and Teach About Sustainable Rainwater Management

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This guide is designed to help individuals, educators, and community groups create, maintain and instruct youth educator sessions about rain gardens to manage stormwater runoff, reduce flooding, and improve local ecosystems by using native plants and environmentally sustainable practices.

Introduction

A rain garden is a specially designed garden that captures and absorbs rainwater runoff from impervious surfaces like roofs, driveways, and streets. By reducing stormwater runoff, filtering pollutants, and replenishing groundwater, rain gardens play a vital role in sustainable land management. They help protect local water bodies by soaking water back into the ground. A modest 1,500-square-foot home can produce up to 1,000 gallons of runoff from just a one-inch rainstorm, with water flowing off roofs, driveways, patios, and even the lawn.

Rain gardens help keep our waterways clean by filtering out pollutants, while also replenishing groundwater that feeds drinking water wells. They provide vital habitats for pollinators like bees, birds, and other wildlife, and help protect local rivers, lakes, and streams. In addition, they can lower your water bill by using rainwater from your roof to nourish your garden, reduce soggy lawn areas, prevent pooling on sidewalks, and even protect against basement flooding.

This guide is designed for educators and farmers interested in creating rain gardens, teaching others about their benefits, and engaging different age groups in hands-on environmental learning. Whether you're introducing the concept to young children or facilitating a more advanced workshop for high school students, you'll find practical advice and age-appropriate activities that make learning both fun and educational.

Note: Learning is not defined by age, but by interest and engagement. While this guide includes specific activities for various age groups, students of all ages and developmental stages can benefit from participating. Younger children may develop advanced interests in topics like design or ecology, while older students might engage with creative play or sensory exploration. Encourage your students to explore based on their individual interests and provide opportunities for them to learn and contribute meaningfully to the process. Every child is capable of learning and making a positive impact!

Section 1: Planning Your Rain Garden

Step 1: Assessing Your Site

- Look for a site that naturally collects water at least 10 feet from your home, such as near downspouts or low spots on your property. Avoid placing it too close to structures like foundations.
- Measure the area of the roof/driveway/sidewalk that will drain to the rain garden. Draw up a base plan. Don't forget to call the city to locate underground utilities.
- Drainage: Watch how water flows across your site after a rainstorm. This will guide your decision on where to place your garden.

Step 2: Design Your Garden

- Shape and Size: How much water do you need to collect? Survey your space, watch for standing water and think about what design would be most beneficial and enjoyable.
- Depth and Soil: Dig your garden to 4–6 inches deep, depending on soil type. If your soil is clay-heavy, make the garden shallower to ensure proper drainage. It is important to plan how to direct water to your rain garden.

Step 3: Selecting Plants

- Native Species: Choose plants that are native to your region and can thrive in both wet and dry conditions. Native plants are more adapted to local soil and weather, making them ideal for a rain garden.
- Layering: Use a mix of tall, medium, and low-growing plants for visual interest and ecological balance.
- Pay special attention to your location throughout the day. Does your space require plants that will thrive in full sun, partial shade or full shade?

Reminder that water flows downhill and your goal is to capture it before it reaches the sewer system

Section 1 Activities

Early Childhood (Ages 3–5)
Activity: Where Does the Water Go?

Objective:
Help young children understand how water flows through the landscape and its role in nature.
Materials:
A shallow tray or large dish / Sand (or dirt) / Small figurines of plants, animals, or trees / Watering can or small cup of water

Instructions:
1. Begin by filling the tray with a layer of sand to create a simple "landscape." You can build up small hills or valleys to show the flow of water.
2. Place the small plant or animal figurines in the sand to create a mini environment.
3. Pour a small amount of water (simulating rain) over the sand and encourage the children to watch where the water goes.
4. Ask the children questions: Where does the water go? Does it stay in one spot or flow away?
5. Guide them to observe how water moves around the plants or figurines, and how it eventually soaks into the sand.
6. After the demonstration, discuss how real rainwater flows into the ground, helping plants grow and nourishing the earth.

Discussion Questions:
- What happened to the water when we poured it on the sand?
- Did it stay in one place, or did it move around?
- How do you think rain helps plants grow?

This activity helps children connect the concept of water flow to the natural world and understand the basic idea of how rainwater nourishes plants and the earth.

Elementary School (Grades K–5)
Activity: My First Rain Garden

Objective:
Introduce students to the concept of designing a rain garden and help them understand its role in managing rainwater.

Materials:

- Paper / Colored pencils or markers / Ruler / Images of native plants (flowers, grasses, shrubs) /Optional: pictures of real rain gardens for inspiration

Instructions:

1. Begin by explaining the purpose of a rain garden
2. Show students images of native plants that thrive in rain gardens. Discuss why native plants are important
3. Have students sketch their own rain garden designs on the paper. Encourage them to think about where the rainwater might go in their design and how the plants would help absorb it.
4. Ask them to consider the layout of the garden:
    - Where would they place plants?
    - How could they create areas where water can flow and soak into the ground?
5. As students work, talk about how rain gardens help prevent flooding and reduce the amount of water that runs off into storm drains.

Discussion Questions:

- Why do you think native plants are good for a rain garden?
- How can a rain garden help keep our community clean and safe?
- What might happen if there were no rain gardens in a neighborhood during a heavy rainstorm?

Extension Ideas:

- After completing their designs, students can share their rain garden plans with the class, explaining why they chose specific plants and how they planned the layout for water absorption.

Middle School (Grades 6–8)
Activity: Design a Water-Absorbing Garden

Objective:
Teach students how to design a rain garden that reduces runoff, absorbs water, and contributes to sustainable water management.
Materials:

- Graph paper / Colored markers or pencils / Images of native plants suitable for rain gardens / Rulers / Example designs of rain gardens

Instructions:

1. Have students design a rain garden on graph paper to be installed at their school or home. They should think about:
    - Water Flow Direction: Where will the water from roofs, sidewalks, or driveways flow to?
    - Plant Placement: Where should different types of plants go
    - Drainage Areas: How can the garden be designed to help water drain effectively into the soil?
    - Elevation Changes: consider slight slopes to direct water flow or create natural barriers.
2. Have students research/choose native plants that would thrive in a rain garden
3. Students should be sure to label key features (e.g., water entry points, plant types, drainage areas).

Discussion Questions:

- What factors did you consider when designing your rain garden?
- How do you think your garden will help reduce runoff and flooding?
- What benefits do native plants provide in a rain garden compared to non-native species?
- How would your design change if you were designing for a larger area, like a public park?

Extension Ideas:

- Have students research the real-world impact of rain gardens in their community or other areas.

High School (Grades 9–12)
Activity: Rain Garden Project Planning

Objective:
Guide students in planning and designing a full-scale rain garden, integrating factors such as size, location, and plant suitability based on environmental conditions.

Materials:
Access to online design tools (e.g., Google SketchUp, Canva, or other digital design software) or graph paper for hand-drawn plans / Research materials on local rainfall patterns and soil conditions (local weather data, soil maps, etc.) / Images or lists of native plants that are suitable for rain gardens / Measuring tools (if on-site)

Instructions:

1. Begin by having students research the local climate and soil conditions of the area where they plan to design the rain garden. Encourage them to look up information on average rainfall, seasonal variations, and soil types.
    - Students should also gather data on the flow of water in their chosen location, identifying areas where water tends to pool or runoff from buildings, sidewalks, or roads.
2. Based on their research, students will design a full-scale rain garden using either online design software or graph paper. Their plan should include:
    - Location: Choose the best area to capture runoff (near rooftops, downspouts, or paved areas). Consider sunlight exposure, soil type, and existing vegetation.
    - Size and Shape: Determine the appropriate size of the rain garden based on the expected water volume, taking into account local rainfall patterns.
    - Plant Selection: Choose native plants that thrive in wet conditions and can help filter out pollutants. Students should research plants that suit both the amount of moisture and sunlight in the chosen location.
    - Water Flow and Drainage: Consider how water will enter and exit the garden. Will there be berms or swales to direct the flow?

High School (Grades 9–12)
Activity: Rain Garden Project Planning

3. Create a Detailed Plan:
    - Students will create a detailed, to-scale drawing or digital model of their rain garden, labeling all key elements like plant types, water entry points, drainage areas, and any elevation changes. They should include measurements (e.g., dimensions of the garden, placement of plants).
    - If possible, students can also create a list of materials they would need to construct the rain garden, including soil amendments and drainage materials.
4. Presentation and Discussion:
    - Have students present their rain garden plans to the class, explaining their design choices. They should highlight the factors that influenced their decisions, such as rainfall data, soil conditions, plant suitability, and location.
    - Discuss how environmental factors (e.g., climate, topography, pollution sources) affect the design of a rain garden and how effective their plan might be in managing runoff and improving local water quality.

Discussion Questions:

- What challenges did you face when choosing the location and size for your rain garden?
- How did local rainfall and soil conditions influence your plant choices?
- Why is it important to consider native plants when designing a rain garden?

Extension Ideas:

- Organize a field trip to a local rain garden or partner with local government or environmental organizations to visit real-world projects.
- If feasible, collaborate with school facilities or community members to implement a student-designed rain garden on campus or in the community.
- Have students compare and contrast their designs, discussing the pros and cons of each and how different designs might suit various environmental conditions.

Section 2: Installing Your Rain Garden

Step 1: Excavating the Area
Once you've marked your design, begin digging your rain garden, removing any existing grass or debris. Create a shallow depression that will allow water to collect and be absorbed. Use the soil you dig up to create a berm on the downside of your rain garden to hold the water.

Step 2: Soil Preparation
Amend the soil with organic material like compost or leaf mulch to improve drainage and support plant growth. It is recommended to dig 2" for healthy soil and 6" for difficult soil and add 2" of compost, then top with mulch to retain moisture and suppress weeds.

Step 3: Planting
Begin by placing the tallest plants in the back or center of the garden, gradually moving to shorter plants around the edges. This layering mimics natural plant growth and allows water to flow toward the center of the garden.

Step 4: Watering and Maintenance

- Water the plants regularly while they establish roots. Once established, rainwater should provide all the moisture they need.
- Weeding is vital the first two years (thistle took over our rain garden in year 1)
- Trimming may be necessary for certain plants, cut stalks down to one foot high and leave the cuttings in the garden as mulch.

Early Childhood (Ages 3–5)
Activity: Watering Our Plants

Objective:
Teach young children the importance of watering plants and help them understand how plants need water to grow, similar to how rain gardens help plants thrive.

Materials:
Small watering cans / Small plants in pots (easy-to-care-for plants like herbs, flowers, or succulents) / A tray or table to set up the plants / A towel or mat to catch any spills

Instructions:

1. Show students how to use the watering cans by gently watering one of the plants. Explain that plants in a rain garden also need water to grow, just like the plants they are taking care of.
2. Have the children take turns using the watering cans to water the plants. Under Water and over water different plants and observe over time.
3. After watering, talk to the children about why it's important to take care of plants and how water helps them grow. Explain that when it rains, the water helps the plants in rain gardens soak up the water and stay healthy.
4. Wrap-up: Ask the children what they think might happen if plants didn't get enough water. Help them understand that plants need water to survive, just like they need food and water!

Discussion Questions:

- What happens to plants when they get water?
- How do you think plants feel when they're thirsty?
- Why do you think rain gardens are important for helping plants grow?

Elementary School (Grades K–5)
Activity: Make Your Own Mini Rain Garden

Objective:
Create a small-scale rain garden to demonstrate how water is absorbed and the role plants play in water management.

Materials:
Shallow containers or trays /Soil / Small native plants / Water (small amounts to simulate rainfall) / Small rocks or gravel for drainage / measuring cups for precise water measurements

Instructions:

1. Fill shallow containers with soil, about halfway. Discuss the importance of soil in a rain garden, explaining that it absorbs and filter water.
2. Plant small native plants in the soil. Arrange the plants however they like, but encourage them to consider spacing and plant types
3. Gently water, simulating rain. Discuss how water behaves when it falls on different surfaces and the effects of runoff.
4. Let students observe how the water spreads across the garden and see how the plants and soil work together to absorb the water.
5. Explain that just like the mini garden, real rain gardens help absorb rainwater and prevent flooding. Discuss how native plants are important for this process because they are adapted to local conditions and help maintain a healthy environment.
    - Ask students to compare how water behaves in the rain garden versus other surfaces like concrete or a lawn. What happens to the water in these areas?

Discussion Questions:

- What happened to the water when you poured it into the garden?
- How is a rain garden different from a parking lot or sidewalk when it rains?
- Why do you think plants are important in a rain garden?

Extension Ideas:

- Try different types of soil (e.g., sand, clay, loam) in separate containers and compare how they absorb water.

Middle School (Grades 6–8)
Activity: Soil Testing Investigation

Objective:
Investigate how different soil types absorb water and analyze how soil composition affects rain garden design and performance.
Materials:
Different soil samples (e.g., sand, clay, loam, garden soil, compost) / Clear containers or cups with drainage holes / Measuring cups / Water / Stopwatch or timer / Recording sheet and pencil / Labels for each soil sample

Instructions:
1. Place each type of soil in a separate, clearly labeled container. Ensure each container has drainage holes
2. Measure out the same amount of water (e.g., 1 cup) for each container. Pour the water onto each soil sample one at a time.
3. Use a stopwatch or timer to record how long it takes for the water to fully absorb into the soil. Make sure to time it from the moment the water is poured until the water stops draining from the bottom.
4. As the water absorbs, observe and note key characteristics of each soil type, such as:
    - Absorption rate (How fast or slow did the water soak in?)
    - Texture and appearance (Was the soil smooth, gritty, or sticky?)
    - Drainage (Did any water pool on top, or did it soak in evenly?)
    - Record your observations on the provided sheet.

Discussion Questions:
- Which soil absorbed water the fastest? The slowest?
- Why is well-draining soil important for preventing flooding in a rain garden?
- Which soil type would be ideal for a rain garden, and why?

Extension Idea:
- Based on the results, have students propose a soil mix or combination that would work best for a successful rain garden.

High School (Grades 9–12)
Activity: Real-World Installation of a Rain Garden

Objective:
Guide students through the process of installing a rain garden on a larger scale, teaching them about design, soil preparation, plant selection, and maintenance to effectively manage stormwater.

Materials:
Shovels and digging tools / Native plants suitable for rain gardens / Soil amendments / Measuring tape or string to outline garden area / Mulch / Watering cans or hose / Gloves and safety equipment / Level or slope guide to assess the land's grade / Markers for plant placement /

Instructions:

1. Begin by choosing an appropriate location for the rain garden. Consider areas with existing runoff from rooftops, driveways, or parking lots. The spot should have proper drainage, away from building foundations, and should be able to capture water effectively.
    - Use measuring tape or string to outline the shape of the rain garden. Discuss the design with the students, considering aspects like water flow, slope, and plant placement.
    - Ensure the site has a slight slope (or design a depression) so that water can naturally flow and collect in the garden.
2. Students will begin by digging out the garden area according to the measurements and design. The depth of the garden should vary, typically 4–8 inches, depending on the size of the runoff area.
    - As students dig, discuss the importance of soil permeability and drainage. In some cases, it might be necessary to amend the soil by adding sand or compost to improve water absorption.
    - Make sure the base of the garden is level & free of large rocks or debris
3. Select and arrange native plants based on their moisture needs and growth height. Taller plants should go in the back or center, with shorter plants and ground cover in the front or edges.
    - Water each plant thoroughly after planting to settle the soil around the roots.

High School (Grades 9–12)
Activity: Real-World Installation of a Rain Garden

4. Mulching and Final Touches:
    - Apply a layer of mulch around the plants to retain moisture, suppress weeds, and regulate soil temperature. Discuss the importance of mulching and how it helps maintain a healthy rain garden environment.
5. Maintenance and Monitoring:
    - Teach students how to maintain the rain garden by checking on the plants regularly, watering as needed and removing invasive weeds that could disrupt the garden's ecosystem.
    - Show them how to monitor the effectiveness of the rain garden. After rainfall, observe if the water is being absorbed or if there is standing water, indicating potential issues with drainage or soil compaction.
    - Create a simple maintenance schedule to track watering, plant health, and any necessary amendments.

Discussion Questions:

- How does this rain garden help manage stormwater differently from traditional drainage systems?
- After completing the installation, have students reflect on the process. What went well? What challenges did they face? How do they think the rain garden will benefit the local environment in terms of stormwater management?
- What maintenance steps are necessary to ensure the rain garden continues to function well over time?
- Discuss the broader impact of rain gardens on urban environments, including reducing flooding, improving water quality, and supporting local biodiversity.
- How would you assess whether the garden is successfully absorbing water or if there are any problems with drainage?

Extension Ideas:

- Have students collect data over time to measure how much water the rain garden absorbs during a rainfall event.
- Encourage students to look for other locations around the school or community where rain gardens could be installed.

Section 3: Community Engagement and Long-Term Impact

Creating a rain garden is a fantastic way to engage with the community, promote awareness, and create lasting positive change. Whether you're working on a farm, at a school, or in a local park, involving others in the planning and installation process makes the project more impactful.

Early Childhood (Ages 3–5)
Activity: Rain Garden Storytime

Objective:
Introduce young children to the benefits of rain gardens through a fun and interactive storytelling session that highlights the connection between plants, water, and wildlife.
Materials:
A storybook or handmade story cards / Blank paper or construction paper for creating the storybook / Crayons, markers, or colored pencils

Instructions:

1. Begin by introducing the concept of a rain garden in simple terms. Show them pictures of rain gardens and talk briefly about how rainwater flows into the garden and helps plants grow.
2. Tell a simple story about a rain garden and the animals that rely on it. Be Creative. As you tell the story, encourage the children to identify different animals and plants that might live in or near the rain garden.
3. After the story, the children to help create their own storybooks!
    - Help them add details to the book, such as drawing flowers, animals, and raindrops.

Discussion Questions:

- Why do you think the plants in the rain garden need water?
- How do the animals feel when they get a drink from the rain garden?
- What do you think would happen if the rain didn’t go into the garden?

Extension Ideas:

- Have a “rainy day” play session. Take the children on a walk around the school or a nearby park to look for real rain gardens or areas where water collects.

Elementary School (Grades K–5)
Activity: Rain Garden Tour

Objective:
Introduce children to the concept of community rain gardens by exploring real-world examples and identifying how they benefit the environment.
Materials:
Printable tour guide (includes a list of items to find and information about each one) / Map of local rain gardens or the school's garden area / Clipboards, pencils, or markers / Magnifying glasses

Instructions:

1. If possible, organize a field trip to a local rain garden in your community. If it isn't feasible, set up a scavenger hunt around the school grounds where there are plant or small water features.
    - Create a printable tour guide that includes:
        - A map of local rain gardens or the school garden area
        - A list of things to find (e.g., types of plants, wildlife, water features, soil texture)
        - Questions to encourage observation (e.g., "Where does the water go in the garden?", "Can you find any bees or butterflies?")
        - Facts about rain gardens
2. Introduce the children to the concept of rain gardens: explain that they help manage rainwater, reduce flooding, and provide habitats for animals. Let the students know they'll be on a scavenger hunt to see all the different parts of a rain garden.
    - If you're visiting a local rain garden, walk with the students to different areas of the garden encouraging them to look closely at the plants, soil, and water features. If doing the scavenger hunt at school, guide them to different garden areas around the grounds.

Section 3: Community Engagement and Long-Term Impact

Elementary School (Grades K–5)
Activity: Rain Garden Tour

3. Scavenger Hunt & Exploration:
    - Ask the students to look for and mark off items on the list, such as:
        - Types of plants: native flowers, shrubs, grasses, or trees
        - Wildlife: insects, birds, or small animals they might see
        - Water features: areas where water collects or flows
        - Soil features: wet or dry areas, drainage spots
    - As they explore, discuss how each of these features benefits the rain garden by filtering water, providing habitats, or helping manage runoff.

Discussion Questions:

- Why do you think it's important for a rain garden to have plants that can tolerate a lot of water?
- How do you think a rain garden helps keep water clean before it goes into our rivers and streams?
- What animals do you think might use a rain garden for shelter or food?
- What would happen if there were no rain gardens in our community?
- Can you see any animals that live in the garden? Why is that important?

Extension Ideas:

- If possible, work with the students to design a rain garden for your school grounds or a local community space.
- Organize a tree planting or plant-care day where students can add native plants to a rain garden or garden space.

Section 3: Community Engagement and Long-Term Impact

Middle School (Grades 6–8)
Activity: Community Rain Garden Project

Objective:
Guide students through the process of planning, designing, and implementing a small community rain garden, with a focus on environmental impact, teamwork, and native plant usage.

Materials:
Survey materials (clipboards, paper, or digital tools for taking notes) / Plant lists (featuring native plants suitable for rain gardens in your area) / Measuring tools / Shovels, garden tools, and other necessary planting equipment / Watering supplies / Soil amendments (e.g., compost, sand, or organic matter for improving soil permeability)

Instructions:

1. Begin by reviewing the purpose of rain gardens. Show they capture rainwater, reduce runoff, improve water quality, and provide habitats for wildlife. Discuss the benefits of using native plants that are suited to local conditions and how these plants help manage water.
    - Community Survey: Students will conduct a survey of the school or community to identify the best location for the rain garden.
2. Design Phase:
    - Divide the students into small teams and assign each team a task:
        - Site Design
        - Plant Selection
        - Water Flow and Drainage
        - Materials and Tools List
    - Design Review:
3. Once each team has completed their design, reconvene the class to review the plans and ensure all components are covered. Provide feedback on the designs and finalize a plan that incorporates the best ideas from each group.

Section 3: Community Engagement and Long-Term Impact

Middle School (Grades 6–8)
Activity: Community Rain Garden Project

3. Implementation Phase:
    - Build out your design!
    - After planting, water the garden thoroughly to help the plants settle. Add mulch around the plants to retain moisture, prevent weed growth, and regulate soil temperature.
4. Ongoing Care & Monitoring:
    - Teach students how to care for their rain garden, including regular watering, weeding, and monitoring plant health.
    - Set up a simple monitoring plan to assess how well the rain garden absorbs water during and after rainstorms.
5. Wrap-Up & Reflection:
    - Have students create a presentation or display to share their project with the school or local community. They can explain the purpose of the rain garden, how it was designed, and the benefits it brings to the environment.

Discussion Questions:

- What worked well and what challenges were faced during the planning and installation process?
- How the project has changed your understanding of stormwater management and environmental sustainability?
- How does the design of the rain garden help manage stormwater runoff?
- What other environmental benefits do rain gardens provide, besides water absorption?
- How can we encourage the community to care for and maintain the rain garden?

Extension Ideas:

- Take students to visit other rain gardens in the community or neighboring areas to see how other designs work.
- Organize a “Rain Garden Education Day” where students present their project to younger grades or community members and teach them about the importance of rain gardens.

Section 3: Community Engagement and Long-Term Impact

High School (Grades 9–12)
Activity: “Community Rain Garden Awareness Campaign”

Objective:
Engage students in creating an awareness campaign to promote the importance of rain gardens and their long-term impact on stormwater management, local ecosystems, and sustainability. Students will design materials, host an event, and collaborate with community members to encourage the installation and maintenance of rain gardens.

Materials:

- Materials to research, document and present the chosen topic. Be creative!

Instructions:

1. Assign students to research the environmental, economic, and social benefits of rain gardens. Topics may include water filtration, reducing stormwater runoff, preventing flooding, supporting local wildlife, and improving aesthetic value in communities.
    - Have students identify examples of local or regional rain garden projects and their long-term positive impacts on the community.
2. Have students develop the goals and objectives of their campaign. This may include:
    - Raising awareness about the importance of rain gardens in managing stormwater
    - Educating the community about how to design, install, and maintain rain gardens
    - Encouraging local schools, businesses, or municipalities to consider rain gardens as a sustainable solution
3. Students will create campaign materials to engage the community. These might include:
    - Posters and Flyers
    - Social Media Campaign
    - Pamphlets and Brochure

High School (Grades 9–12)
Activity: “Community Rain Garden Awareness Campaign”

4. Plan A Community Event. Students will work together to plan a community event where they will present their findings and raise awareness about rain gardens.
    - The event might include:
        - A presentation or workshop
        - Q&A session
        - Displays of rain garden designs and local examples
        - Plant giveaways or starter kits
    - If possible, invite local environmental organizations or native plant specialists to speak about the role of rain gardens in urban planning and stormwater management.
5. Community Engagement
    - Students can create a hashtag for their campaign and encourage people to share photos, thoughts, and questions online.
        - Students can also post updates, event invites, and educational content on social media platforms.
    - Encourage students to speak with local businesses, schools, and municipal offices to ask them to support the campaign
    - Engage local news outlets to spread the word
6. After the event, students should create a simple survey or feedback form to gauge the community’s understanding and interest in rain gardens. Questions might include:
    - "Did you learn something new about rain gardens?"
    - "Would you consider installing a rain garden at your home or business?"
    - "What challenges do you think people face when installing or maintaining rain gardens?"
    - Students should reflect on the effectiveness of their campaign. Did they meet their goals? How much community engagement did they receive? What could they improve for future campaigns?

Section 3: Community Engagement and Long-Term Impact

High School (Grades 9–12)
Activity: “Community Rain Garden Awareness Campaign”

Discussion Questions:

- Who is advocating for rain garden initiatives in our local government or school? How can we collaborate with these organizations.
- How do you think raising awareness about rain gardens could lead to long-term environmental benefits for our community?
- What challenges did you encounter while organizing your campaign, and how did you overcome them?
- How could the community continue to take action after the campaign to increase the use of rain gardens?

Extension Ideas:

- Create a Rain Garden Ambassador Program. Have students set up a program where they mentor other students or community members on how to build and maintain rain gardens.
- Partner with Local Schools and/or Farms. Encourage other schools in the district to design and install their own rain gardens, fostering a district-wide initiative.

Troubleshooting Common Issues in Rain Garden Installation

Creating a rain garden can be an enjoyable and rewarding process, but like any garden, it comes with its challenges. Below are some common issues that you may encounter when installing or maintaining a rain garden, along with tips for troubleshooting and finding solutions.

Poor Drainage or Standing Water:
Water is not draining as expected, and standing water remains in the rain garden for several hours or days, which can drown plants or lead to unwanted pests like mosquitoes.

Solution: Check the Soil: Ensure the soil has been properly amended with organic matter like compost to improve drainage. If the soil is too compacted or heavy (like clay), it may need to be loosened or replaced with a more porous mix.

Adjust the Depth: Make sure your garden is 4–6 inches deep, but not too deep for the plants selected. Deeper garden beds may slow down water infiltration.

Check the Slope: Verify that the rain garden is gently sloped toward the center for proper water flow. If the slope is too flat, water may not flow towards the garden as it should.

Plants Dying or Not Thriving:
Your plants are wilting, turning yellow, or not growing well, despite regular watering and sunlight.

Solution: Too Much or Too Little Water: Native plants in rain gardens are adapted to both wet and dry conditions, but they still need proper watering during establishment. If the garden is receiving too much water (from standing water or poor drainage), or if it’s too dry, the plants may suffer.

Troubleshooting Common Issues in Rain Garden Installation

Check if your garden has good drainage, and if not, improve it.
Consider adding a layer of mulch to retain moisture.

Incorrect Plant Selection: Ensure that the plants you've chosen are suited for the specific conditions of your garden whether it's wet, dry, or somewhere in between. Some plants may not be as adaptable as others.
Choose native plants that are well-suited to local soil and rainfall conditions.

Soil Quality: Poor soil health can stunt plant growth. If the soil is too acidic or too alkaline, it can affect plant health. Test the soil pH and adjust it by adding lime (to raise pH) or sulfur (to lower pH) as necessary.

Weeds Taking Over:
Weeds are growing faster than your plants, competing for water, nutrients, and sunlight.

Solution: (Mulch) Use a thick layer (2–3 inches) of mulch like shredded bark or wood chips to suppress weed growth while allowing water to infiltrate. Mulch also helps retain moisture and keep the soil temperature stable.
Prevention: Before planting, remove any weeds and use a weed barrier fabric (biodegradable) beneath the soil to prevent them from reemerging.
Regular Maintenance: Keep an eye on the garden during the growing season and pull weeds manually when they first appear. Hand-pulling is the most effective way to prevent weeds from becoming established.

Pests and Insects:
You notice pests like aphids, slugs, or even mosquitoes in your rain garden, potentially harming plants or causing discomfort for visitors.

Solution: Encourage Beneficial Insects. Many pests are kept in check by natural predators like ladybugs, predatory beetles, and spiders. Encourage these beneficial insects by planting diverse species in your rain garden.
Natural Pest Control: For common pests like aphids, use organic solutions such as neem oil or insecticidal soap. For slugs, you can set up beer traps or use diatomaceous earth around plants.

Mosquito Control: If you're concerned about mosquitoes, make sure water doesn't stagnate for long periods in your rain garden. This will reduce breeding grounds for mosquitoes. Mosquito larvae cannot thrive in moving water or wet soils.

Erosion or Soil Loss
The soil around your rain garden is eroding, causing plant roots to become exposed or the garden shape to lose definition.

Solution: Plant Ground Covers: Low-growing, dense plants like ground covers or grasses help stabilize soil with their root systems.

Add Mulch: A thick layer of mulch around plants will help prevent soil erosion and promote water retention.

Check Water Flow: If water is rushing too quickly through the garden, adjust the design so that it slows down and spreads more evenly. Adding berms (small mounds of earth) or check dams can help manage water flow and reduce erosion.

Incorrect Water Flow
Water is flowing over the edges of the rain garden, bypassing it entirely and not being absorbed properly.

Solution: Check the Flow Path: Ensure that the water flow entering the garden is directed properly to avoid bypassing. You can install a small berm (a raised edge) around the garden to help direct water toward the center.

Inlet Design: If you're capturing water from a downspout or driveway, make sure the inlet area is wide enough and designed to handle the volume of water that might flow during heavy rain. A stone or gravel trench (called a "swale") can help slow water and spread it into the garden.

Increase the Garden Size: If your rain garden is too small to handle the volume of water from a downspout, you may need to enlarge the garden or consider adding more rain gardens to the landscape.

Limited Biodiversity
Your rain garden doesn't seem to attract a variety of wildlife, such as bees, butterflies, or birds.

Solution: Plant Variety: Increase plant diversity by including a mix of flowering plants, shrubs, and grasses. The more plant species you have, the more likely your garden will attract different types of pollinators and beneficial insects.

Seasonal Interest: Choose plants that bloom at different times of the year to provide a continuous food source for wildlife. For example, some plants bloom in early spring, while others provide seeds in the fall.

Native Species: Always choose native plants, as they provide the most suitable habitat for local wildlife and pollinators..

General Maintenance Tips:
Monitor Regularly: Regularly check your rain garden after rainfall to ensure that water is being absorbed efficiently and that plants are thriving.

Maintain Plant Health: Trim dead or diseased plants and remove any debris that may obstruct water flow.

Replenish Mulch: Add mulch annually to help retain moisture, keep weeds down, and support plant health.

By troubleshooting these common issues, you can ensure that your rain garden remains functional, beautiful, and beneficial to the environment. With a little patience and regular attention, your rain garden will thrive, providing a sustainable solution for managing stormwater while promoting local biodiversity.

Native Plants (Zone 6b)

Rain Garden Plant List (Zone 6b) by the Washtenaw County Water Resources Commissioner's Office

Salt-Tolerant Native Plants for garden sites that will be around highly salted areas during the winter months

Deer Resistant Plant List by MSU Extension

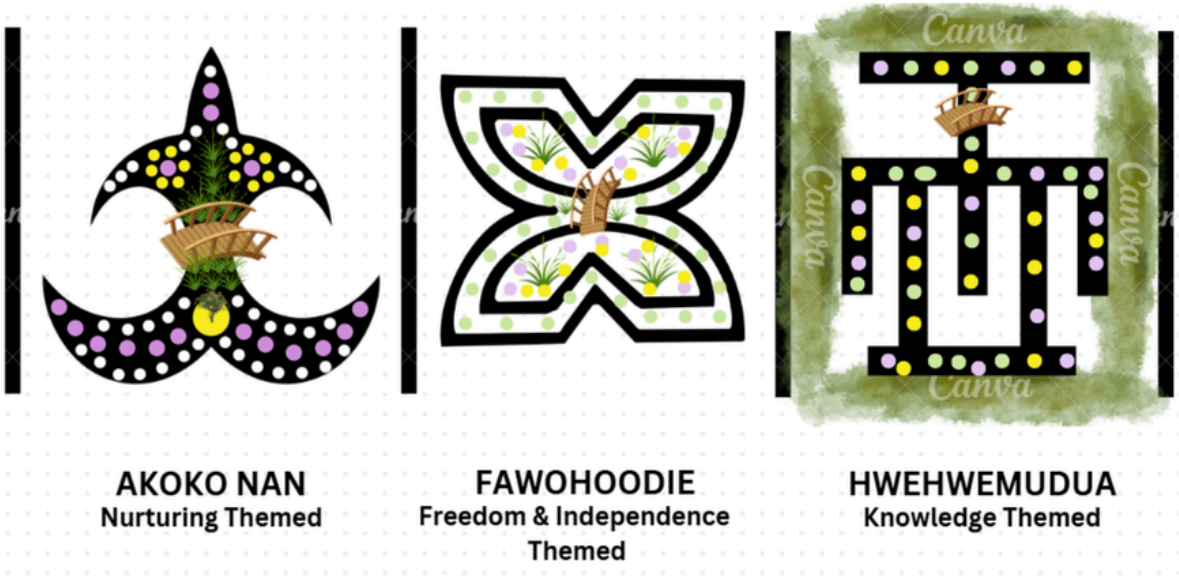
Juglone Resistant Plants by Prairie Nursery

List of Native Plant Suppliers for Business Directory by the Wildflower Association of Michigan

Google Map with links to local native plant nurseries in SE Michigan.

Akoko Nan Community Rain Garden Project

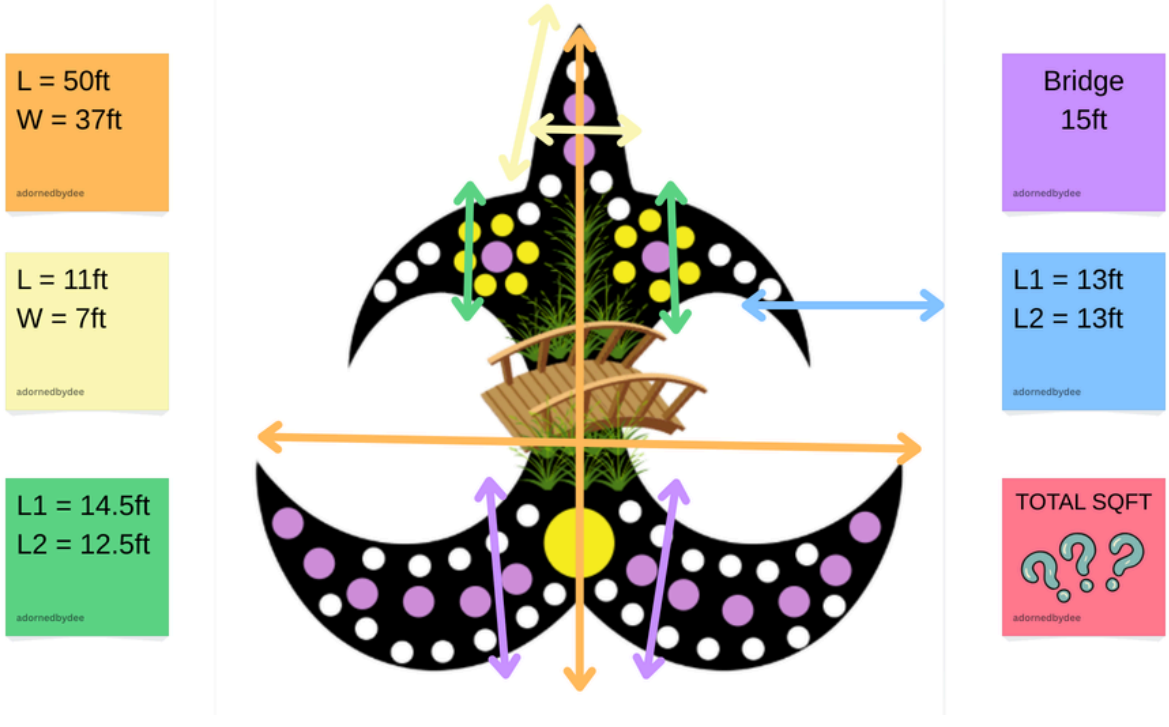
Photos of the space from September 2009 and May 2019



We started by engaging the community to select one of three design concepts we developed in Canva, ensuring the final choice truly reflects the cultural heart of Asibara Forest and the community.

As a Native American toad habitat and organic farm site, we chose to hand-dig the space. Along the way, we uncovered multiple layers of concrete left behind from the previous home.

It took us about 1.5-2 months to complete the dig.



We estimate 940-1,000 square feet. If math is your thing help us out and let us know the square footage of our rain garden!

Akoko Nan
“The Leg of the Hen”

This African Adinkra symbol represents parental love, care, and discipline, reminding us of the importance of raising children in a safe, nurturing environment. It reflects our commitment to caring for the land, using it to educate and inspire others to do the same. These values are central to both our farm and community, emphasizing the creation of spaces that support growth and learning. In our native rain garden, Akoko Nan embodies this dedication to nurturing both the land and the people it sustains.

Akoko Nan Rain Garden Plant List

SHRUBS	NATIVE GRASSES	SEDGES
New Jersey Tea	Big Bluestem	Plains Oval Sedge
Shrubby Cinquefoil	Little Bluestem	
Black Currant	Indiangrass	
Buttonbush	Prairie Dropseed	
	Side-Oats Grama	
	June Grass	

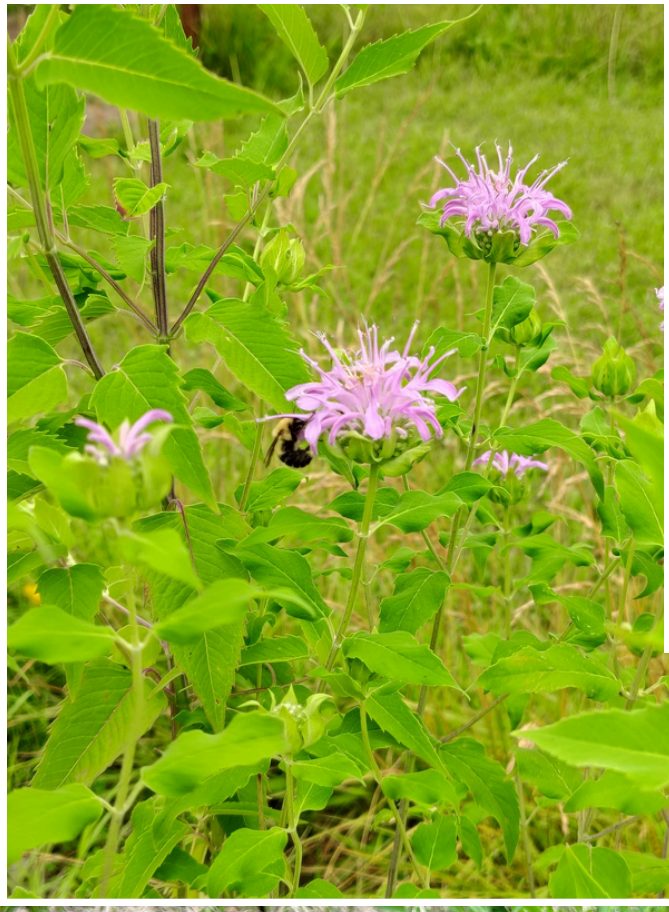
FLOWERING PERENNIALS (FORBS)

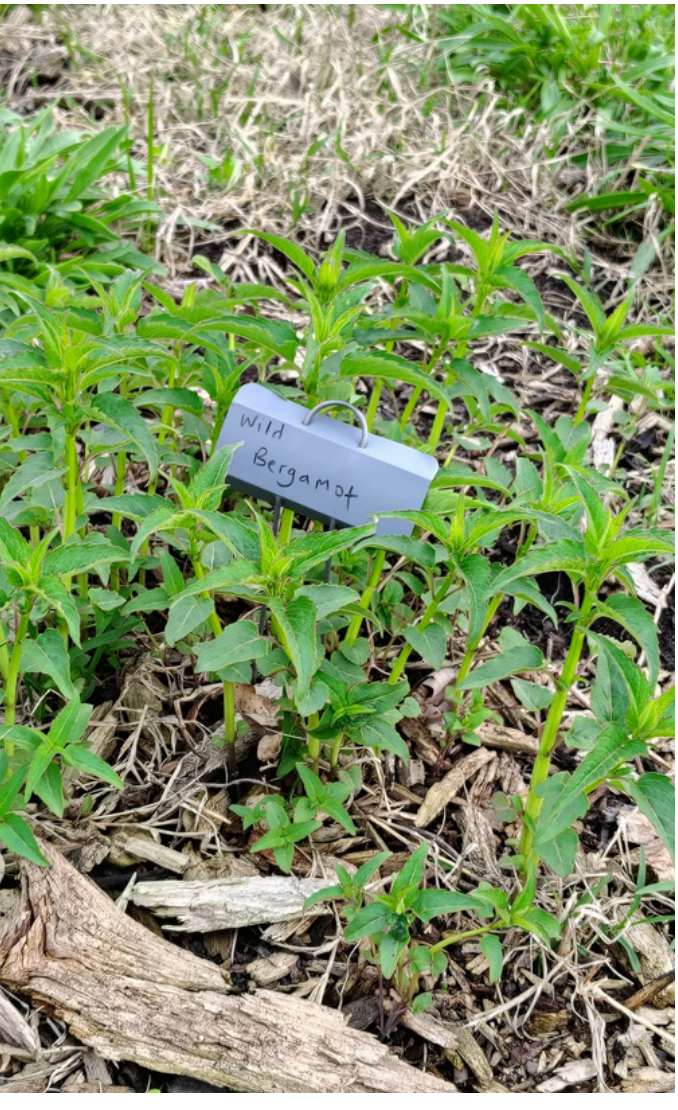
Spring to Early Summer Bloomers	Mid-Season Bloomers	Late Season Bloomers
Columbine	Butterfly Milkweed	Black-Eyed Susan
Golden Alexander	Milkweed	New England Aster
Sand Coreopsis	Purple Prairie Clover	Aromatic Aster
Foxglove Beardtongue	Purple Coneflower	Smooth Blue Aster
Calico Beardtongue	Purple Giant Hyssop	Northern Blazing Star
White Wild Indigo	Yellow Hyssop	Dense Blazing Star
Wild Strawberry	Wild Bergamot	Rough Blazing Star
	Spotted Bee Balm	Showy Goldenrod
	Virginia Mountain Mint	Gray Goldenrod
	Rattlesnake Master	Stiff Goldenrod
	Nodding Wild Onion	White Snakeroot
	Blue Mistflower	Late Figwort

This rain garden features a diverse mix of native shrubs, grasses, sedges, and flowering perennials that provide:

- Continuous bloom from early spring through late fall
- Extensive pollinator habitat (bees, butterflies, beneficial insects)
- Monarch host plants (milkweed species)
- Deep-rooted species for improved stormwater infiltration
- Erosion control through groundcovers and bunch grasses
- Four-season visual interest and wildlife habitat

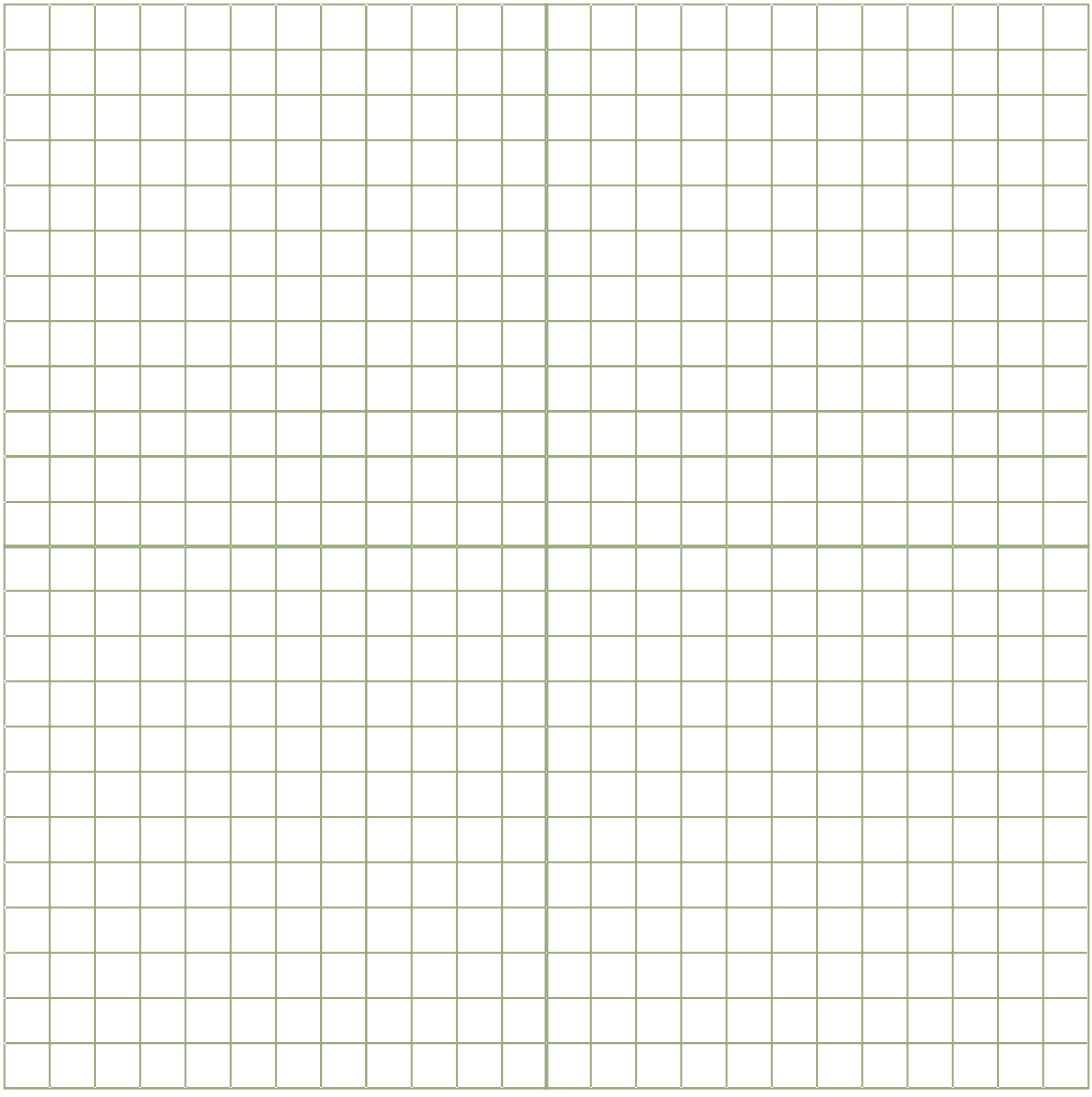
Note: We experienced a significant thistle outbreak that overtook many establishing plants. During the upcoming growing season we will conduct a site assessment to evaluate plant survival and overall garden health.





Year One

Plan Your Rain Garden



Click here to view a master list of rain gardens in Southeast Michigan

For more information about this project, contact:

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