

## **Rain Garden Native Plant Considerations**

**GRADE LEVELS:** 4-5

**ESTIMATED TIME:** 45 minutes

### **OBJECTIVES:**

Students will be able to:

- Understand how to manage stormwater runoff through the use of rain gardens
- Identify the different parts within a rain garden and their purpose
- Identify New Jersey native plants typically found in rain gardens
- Research New Jersey native plants for the schoolyard rain garden

### **MATERIALS:**

- Stormwater Management in Your Schoolyard journal for each student
- Colored Pencils
- Transparent tape
- Chalk & Chalkboard or Dry-Erase Markers & Whiteboard
- Reference materials (books, websites, etc.)
- Rutgers Native Plant Information Sheets
- "What Makes a Healthy Garden" Poster
- "Design Your Rain Garden" Poster
- One Rain Garden Native Plant Worksheet for each group of students

### **PROCEDURE:**

#### ***Part 1: Pre-Test***

***Estimated Time:*** 10 minutes

#### ***Preparation:***

1. Prepare the Stormwater Management in Your Schoolyard journal for each student to complete for this module (Before Lesson and After Lesson).
2. Prepare the Stormwater Management in Your Schoolyard journals for each student.

#### ***Directions:***

1. Distribute a pencil and a Stormwater Management in Your Schoolyard journal to each student.
2. Have the students fill out their name and their teacher's name on page 1 of the journal.
3. Read the questions on the "Before Lesson" page and have the students complete.

4. Have the students hold onto their pencil and Stormwater Management in Your Schoolyard journal until the end of the module.

## **Part 2: Native Plant Rain Garden Research and Mural**

**Estimated Time:** 25 minutes

### **Preparation:**

1. This module is an optimal time to have a Guest Speaker (Garden Gnome) come in and talk about native plants with the students.
2. Separate the class into small groups.
3. The students will be working in small groups to research different native plants typically found in rain gardens. The information gathered from the groups' research will be used to create a class mural of a rain garden.
4. Gather the following materials for the rain garden mural activity:
  - a. Colored Pencils
  - b. Transparent tape
  - c. Chalk & Chalkboard or Dry-Erase Markers & Whiteboard
  - d. "What Makes a Healthy Garden" Poster
  - e. "Design Your Rain Garden" Poster
  - f. Reference materials (books, websites, etc.)
  - g. Rutgers Native Plant Information Sheets
  - h. One Rain Garden Native Plant Worksheet for each group of students
5. Gather resources for students so they are able to research native plants of New Jersey. Some resources to consider are:
  - a. [www.npdc.usda.gov](http://www.npdc.usda.gov)
  - b. [www.plants.usda.gov](http://www.plants.usda.gov)
  - c. [www.npsnj.org/lists\\_njplants.htm](http://www.npsnj.org/lists_njplants.htm)
  - d. <http://www.plantnative.org/>
  - e. *Rain Garden Manual of New Jersey* by Rutgers Cooperative Extension Water Resources Program and the Native Plant Society of New Jersey
  - f. *The Encyclopedia of North America Wild Flowers* by Joan Barker
  - g. *Wetland Planting Guide for the Northeastern United States: Plants for Wetland Creation, Restoration, and Enhancement* by Gwendolyn A. Thunhorst

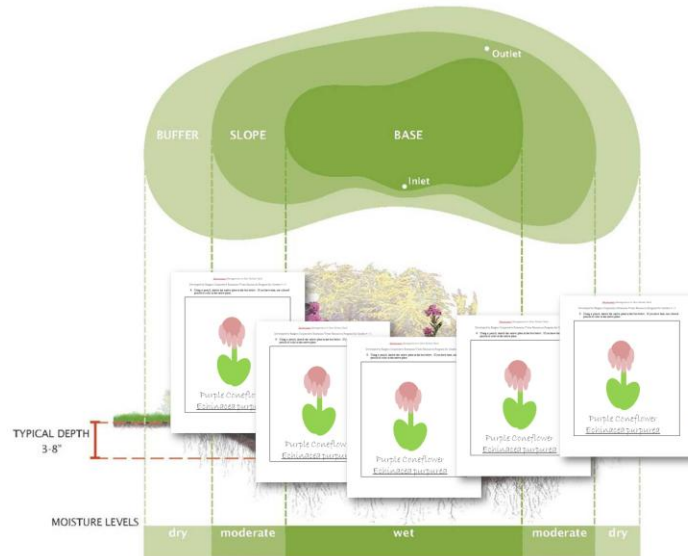
### **Directions:**

1. Ask students what they think the difference between a rain garden and a garden is. (Optional: Create a table and list the responses on the board.) *A rain garden is a landscaped, shallow depression that captures, filters, and infiltrates stormwater at the source before it becomes runoff (runoff carries nonpoint source pollution that can harm our waterways). A rain garden collects water from impervious surfaces (i.e., areas that do not allow water to go through), such as roof tops, parking lots, driveways, and roadways. A rain garden recharges the groundwater, which helps replenish the aquifers (where NJ gets 50% of its drinking water). A rain garden uses plants that help control soil*

*erosion by stabilizing soils and increasing infiltration. Some common analogies to help students understand rain gardens include:*

- *A rain garden is like a bath tub for rain water.*
  - *A rain garden is like a sponge (it absorbs and cleans water).*
2. Using the “What Makes a Healthy Garden” poster, discuss with students the five characteristics that indicate a healthy garden. List these on the board and briefly share with the students the information for each.
    - a. Sunlight: plants get their energy from the sun through a process called photosynthesis – sunlight activates the chlorophyll in leaves to convert raw materials from soil and air into carbohydrates, which are the plant’s food.
    - b. Air: plant leaves draw carbon dioxide from air and combine it with water to make carbohydrates.
    - c. Water: is the main ingredient for photosynthesis, it is also a primary component of protoplasm, the basic material that constitutes the plant’s structure. Water also helps transport nutrients from the soil to the plant’s roots.
    - d. Nutrients: depends on the soil’s water-holding capacity, acidity, and population of beneficial soil organisms.
    - e. Space: plants also need space to grow. If the plants do not have enough space and if they must compete with neighboring plants for nutrients, light, and water, plants may find it difficult to grow or survive.
  3. Using the “Design Your Rain Garden” poster, explain the different parts of a rain garden and the native plants typically found in each part of the rain garden.
    - a. Parts of the rain garden:
      - i. Base: provides surface storage of the stormwater runoff, and provides for the evaporation of a portion of the runoff (typical moisture level: wet).
      - ii. Slope: an area completely or mostly surrounded by higher land (typical moisture level: moderate).
      - iii. Buffer: any level strip of ground at the sides, or along the base, of a slope (typical moisture level: dry).
    - b. Native plants typically found in each part of the rain garden:
      - i. Grasses and Ground Covers
        1. Base: Bluejoint grass, Sedges, Fowl Mannagrass, Softrush
        2. Slope: Big Bluestem, Virginia Wild-rye, Switchgrass, Wool grass
        3. Buffer: Broomsedge, Bearberry, Panic grass, Switchgrass, Little Bluestem, Indiangrass
      - ii. Wildflowers and Ferns
        1. Base: Swamp Milkweed, Marsh Marigold, Turtlehead, Boneset, Rose-mallow/hibiscus, Blueflag iris, Cardinal flower, Blue lobelia, Monkey flower, Royal fern

2. Slope: New England aster, New York aster, Columbine, Coreopsis, Joe-pye Weed, Blazing Star, Sweet Pepperbush, Sensitive fern, Cinnamon fern, Ironweed, Goldenrod
  3. Buffer: Butterfly Milkweed, Wild Indigo, Purple Coneflower, Beebalm, Black-eyed Susan
- iii. Trees and Shrubs
1. Base: River Birch, Buttonbush, Silky Dogwood, Green Ash, Swamp White Oak, Pin Oak, Cranberrybush viburnum
  2. Slope: Red Maple, Service Berry, River Birch, Silky Dogwood, Red-twig Dogwood, Green Ash, Winterberry, Sweetbay Magnolia
  3. Buffer: Hackberry, Red Bud, Pepperbush, American Holly, Bayberry, Witchhazel, White Oak, Red Oak, Arrowwood viburnum
4. Assign each group of students one native plant that are commonly found in rain gardens and will be planted within the school's rain garden (plants that are **bolded and underlined** in the list above will most likely be planted in the school's rain garden as they are part of the "butterfly garden" rain garden design).
  5. Explain to the students that are to research one native plant and complete the "Rain Garden Native Plant Worksheet" while in their groups. Explain that they should use the reference materials to help answer the questions about the native plant and they will need to prepare a sketch of each of their assigned native plant. *During the group activity, teachers should be walking around each group to help facilitate the research to ensure that the students understand the information and are headed in the right direction.*
  6. Draw an outline of a rain garden on the board with a piece of chalk/ dry-erase marker.
  7. After the students are done with their research, ask two (2) representatives from each group to present their native plant to the class. After they discuss their native plant, have the representatives tape their sketches of their native plant to the outline of a rain garden. *Make sure that the students are taping their native plant to the parts of the rain garden where the plant should go (i.e., base, slope, buffer). The rain garden outline will turn into a "rain garden mural" as groups tape their native plants to the outline. Here is a rendering of how the "rain garden mural" might turn out (Note: The purple coneflower would go in the "Buffer"/ "Dry" section of the rain garden, not in every part of the rain garden).*



#### **Part 4: Putting it All Together and Post-Test**

**Estimated Time:** 10 minutes

#### **Preparation:**

1. Prepare the Stormwater Management in Your Schoolyard journal for each student to complete for this module (Before Lesson and After Lesson).

#### **Directions:**

1. Moderate a brief class discussion to help pull the module content together. Ask the students the following questions:
  - a. What are the different parts of a rain garden and what is the purpose of each part? *Base, Slope and Buffer*
  - b. Are native plants able to tolerate New Jersey's climate (all 4 seasons: hot, cold, wet, or dry)? *Yes, the plants are native to New Jersey.*
  - c. Do you think that native plants need fertilizer to help them grow? *Discuss how these plants are native to New Jersey, so they do not need fertilizer or other chemicals to help them grow.*
  - d. Will the native plants come up each year? *Discuss how the plants are perennials, so they will come up each year.*
2. Ask the students to answer the prompt in their journal.