Date of Lesson: April 18, 2019

Group Member(s): Jasmine Leung

Title: Rain Garden Rundown

Subject/Main Topic: Rain Gardens and Natural Filtration Systems

Grade Level: 2 - 3

Overview: Students will learn what rain gardens are, how they work on a very basic level, and what the main benefits of rain gardens are.

Learning Objectives:

Students will learn:

* What rain gardens are
* That rain gardens filter, or make more clean, rainwater
* Why rain gardens are important and how they are used

Key Words/Terms:

 Filter = to remove things we don’t want in the water from the water

 Rain Garden = a special type of garden which collects and filters rainwater and runoff

 Pollutants = things in the water that make it unsafe to drink or in large amounts have

negative environmental effects

 Fertilizer = chemicals which are given to plants to help them grow better. In large

amounts in the water, they can cause problems.

 Runoff = Water that has washed over streets and lawns (instead of in natural systems

like rivers). Often contains things like fertilizer, oil, dirt, chemicals, etc. from roads and lawns

Materials List:

 Plastic bottles (pre-cut so that one end is removed and open)

 Rocks/pebbles

 Sand

 Compost

 Soil

 Grass/plant

 Newspaper

 Poster Paper/Sticky paper

 Markers and coloring supplies

 Scissors

 Food coloring

Flooding demos (aluminum pans with sheet of aluminum foil creating a sort of slope shape. One is filled with soil in a sloped shape to emulate a sloping street. The other has soil formed in a flat slope to emulate a flat street/road. Aluminum foil covers will be placed over the soil to emulate road/pavement. Uncovered soil represents rain gardens)

Outline:

**Self-Introduction (5 min):**

Hello everyone! We are students from the University of Washington. Over the next couple of months we will be coming on Thursdays to visit and teach you about science and the environment.

 My name is Jasmine and I am studying…. Etc.

Now you know our names but we don't know yours, can we take turns and raise our hands and tell us your name and something about you, like your favorite food?

**Classroom Rule Establishment (5 min):**

Thanks for sharing! Before we get started, let's establish some classroom rules. I'm sure that in your classes here you already have some classroom rules. What are some rules your class have that would be good for us to have?

(I want to have: be respectful/kind, raise your hand, don't talk while others are talking, try your best)

**Lesson Introduction (5 min):**

So today we are learning about rain gardens. Has anyone heard of rain garden before? What do you think they might be? Think about the name. What are gardens? They are places where we choose to grow plants. A *rain garden* is a special type of garden that collects rainwater and cleans it by using plants and soil. Here is a picture of a rain garden. The rainwater goes into the rain garden and is cleaned. Today we are going to learn all about rain gardens, how they work, why they are important, and then you can make your own mini rain garden at the end of club.

The following 3 activities will be different stations/groups that will rotate:

**Activity 1 (10 min): Pollutants Card Matching Activity - Jasmine and Sarah**

So we learned that rain gardens clean rainwater. Why might we want to clean rainwater? (You can think about what happens to rainwater) (Answer: even though we don’t drink rainwater, rainwater ends up in our environment like rivers and lakes. Also sometimes rainwater can end up in our drinking water. It gets cleaned by the city, but sometimes not everything can be removed). Things that we don’t want in the water, that can make us sick or be bad for the environment are called *pollutants*. What kinds of pollutants do you think might be in the water? (Answers: oil, fertilizer, poison, pet poop, bacteria, bugs, trash, weed killer and pest killer, etc.)

To help us remember the different kinds of pollutants we are going to play a matching game. We will take turns overturning two cards. If they match, then you can collect the cards. If they don’t match, then you turn them over again.

(If finish a couple of rounds, can do speed rounds, 1 vs 1 competition).

**Activity 2 (10 min): Flooding Demonstration - Victor, Matthew**

Another good thing that rain gardens do is that they reduce flooding. This works because water can enter the ground better using rain gardens compared to just grass and roads and sidewalks. As a demonstration, let’s test out how much water ends is collected when we don’t have rain gardens, and how much is collected when we do have rain gardens.

[Take out flat pan with foil with no uncovered soil. Add water and watch it flood]

This pan is like when we have a flat street. The foil is like the road. In this example, this is like if we only had roads and no yards or rain gardens. What kinds of places have no yards or gardens or soil to soak up the water? (the city) When it rains, does water go through the road or sidewalks? (No). It can only go into the soil or it goes into the sewers. But when it rains a lot, sometimes the sewers overflow and then it floods.

[Replace foil with a thin strip of foil across the pan, leaving soil uncovered]

This pan is like when we have a street, but there are yards, soil, or rain gardens next to the street. What do you think will happen this time when we pour the water? (Water will sink into the soil)

[pour water]

This time water went into the soil, so our street didn’t flood. This shows us why we want things like yards and rain gardens to take in rainwater. Rain gardens are usually even been than lawns at taking in water. (People often put them in places that collect a lot of rainwater, like next to the roof drainage pipe)

[Repeat with other pan with soil in a slope shape if time. Alternatively, if the kids are interested, you can offer that they “create” their own street/slope with the soil and aluminum foil and invite them to test pouring water to see how well it prevents flooding. You can ask them questions such as “Is this like a street in real life?”, “How well do you think this would work to prevent flooding?”)

**Activity 3 (10 min): Bees and Butterfly Craft-Making - Jose, Lina**

In addition to cleaning rainwater, another good thing about rain gardens is that they provide flowers and plants for animals and insects. Two creatures which rain gardens are especially good for are bees and butterflies. Why do you think bees and butterflies might like rain gardens? (Answer: You can plant flowers in rain gardens and bees and butterflies like flowers. They eat and drink things inside the flowers called pollen and nectar.)

Later we will be making our own rain gardens, so let’s make our own butterflies and bees for our rain garden.

(Let the kids cut/draw/glue bees and butterflies. LAter we willt ape them to the rain gardens. If you’d like, you can mention the basic concept of pollination if you think it is not too advanced)

**Activity 4 (20 min): Make a Rain Garden**

A rain garden cleans the water using the plants and the soil. When water goes past the past roots and through the soil, it is filtered. Does anyone know what *to filter* means? It means to clean something by taking things out. Rain gardens make water clean by removing pollutants.

Now we are going to make our own rain gardens and see them filter the water. Although our rain gardens are very small and simple, and so they don’t filter the water as well as larger, fancier rain gardens.

For our rain garden, we are each going to get a plastic bottle (pass out bottles). At the bottom we have (soil and then) rocks, and on top of that we have sand. Then on top of that we have more soil, and then we have plants at the top. (show diagram). We careful when putting in each layer. We don’t want them to get mixed up. Pat down each layer gently before you add the next layer.

Now it’s your turn to make a mini rain garden!

(after 15 min)

Now that we have all made our rain gardens, let’s test them out. We will each come around and give your group from water with food coloring. Your group leader (us) will add a little water to your rain garden and you can watch it work!

**Conclusion (5 min):**

Why are rain gardens important?

What are some layers of rain gardens?

What are some pollutants rain gardens remove from water?

What are other benefits of rain gardens?

What are two insects that rain gardens can help?

**Snack (15 min):**

 Fruit

**Extension:**

Homework