

## Lesson Plan: Bioretention Filtration Systems

Skills: Research

Grade Level: High School (9-12)

Time : 50-60 minutes

Objectives: Students will...

Explore the concept and mechanics of bioretention filtration systems

Understand the environmental benefits of filtration systems for communities

Engage in designing and creating a bioretention system for a local environmental challenge

### Materials Needed:

- Pictures or videos of bioretention systems
- Paper and pens/pencils for brainstorming and design
- Access to internet for research

**Duration:** Approximately 90- 120 minutes

### Introduction (15 minutes):

1. Start with a discussion on environmental challenges related to urban runoff and water pollution. Introduce the concept of *bioretention* as a sustainable solution.
2. Show pictures or videos of bioretention systems in action. Explain how these systems work to filter pollutants and improve water quality.

### Activity: Bioretention Systems (30 minutes):

1. **Research:** Divide students into small groups. Provide each group with laptops or access to internet resources.
2. **Task:** Instruct each group to brainstorm and design a bioretention system tailored to address a local environmental challenge (e.g., reducing runoff from school grounds, improving water quality in a nearby stream).



3. **Design:** Provide graph paper or grid paper for groups to sketch out their bioretention system designs. They should label key components such as vegetation zones, soil layers, and drainage mechanisms. Ask groups to prepare a brief proposal outlining their design rationale, expected benefits, and potential challenges.

### **Conclusion and Presentations ( 30-60 minutes):**

1. **Presentations:** Each group presents their bioretention system design to the class, explaining their concept and how it addresses the identified environmental challenge. Each group will have 15 minutes to present.
2. **Reflection:** Lead a discussion on the advantages and limitations of bioretention systems compared to traditional stormwater management techniques. Discuss real-world applications and future trends in sustainable urban development.

**Assessment:** Assess student understanding through participation in discussions, the quality of their bioretention system designs and proposals, and their ability to articulate the environmental benefits of bioretention systems.