

## Rains to Roots



In our *Rains to Roots* **high school program**, students explore the complicated question: *Why is urban runoff a problem, and how can green infrastructure be a solution?* Through the program, students are tasked by the City of Richmond to investigate urban runoff issues at a local park. In this fictional scenario, urban runoff is impacting the city budget, a nearby creek, and the San Francisco Bay watershed. Over the course of the program, students design green infrastructure for the park and create a proposal for the city. This program is intended to provide Richmond-area students with both a theoretical understanding of the benefits of green infrastructure, and practical experience interacting with green infrastructure in their own community.

### Program Overview

Lesson 1: What's the Problem with Runoff? (1-1.5 hours in the classroom, TWP-led)

Lesson 2: Introduction to Green Infrastructure (1-1.5 hours in the classroom, TWP-led)

Service Learning Trip: Students visit actual bioswales and rain gardens and participate in planting, maintenance and community engagement. See the next page for more details about the field trip.

Lesson 3: Expanding Green Infrastructure Solutions (1-1.5 hours in the classroom, TWP-led)

### Program Goals

1. Students learn how green infrastructure can mitigate the problems caused by urban runoff, such as flooding, pollution, and erosion.
2. Students are introduced to green infrastructure in their community through service learning opportunities.
3. Students engage in an engineering design challenge in which they collect and examine data to investigate a phenomenon, build and test models, and communicate their proposed solution.

### Program Evaluation

The Rains to Roots program is evaluated through a student pre- and post-survey, as well as a written teacher evaluation. Teachers are also invited to provide feedback through a brief in-person interview following the program.

*The Watershed Project's mission is to inspire Bay Area communities to understand, appreciate, and protect our local watersheds.*

If you're interested in bringing this program to your school, please contact us at: [education@thewatershedproject.org](mailto:education@thewatershedproject.org)

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## Standards Connections

Rains to Roots supports learning and engagement in the following Next Generation Science Standards:

- *Engineering Standards:* Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. (HS-ETS1-2). Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts. (HS-ETS1-3).
- *Earth Science Standards:* ESS3.C: Human Impacts on Earth Systems. The sustainability of human societies and the biodiversity that supports them requires responsible management of natural resources (HS-ESS3-3). Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation (HS-ESS3-4).

## Service Learning Trip

The service learning trip takes students to one of our local project sites along the Richmond Greenway, where they can see real examples of green infrastructure in their community. Students will have the opportunity to support planting and maintenance on these sites alongside The Watershed Project staff to better understand what it takes to create and maintain green infrastructure installations.



Carlson Meadow, pictured here, is one possible service learning trip location.

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