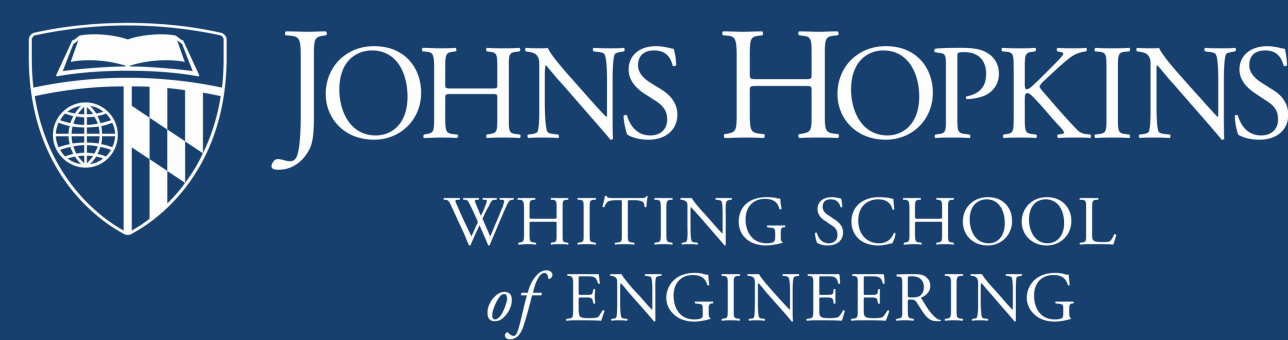


Restevoir: Rainwater Collecting Bench for Water Conservation

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Project Partner: Laura Genello (BCPS), JHU Grounds
Faculty Mentor: Alissa Burkholder Murphy



Project Background

Access to water is a major challenge for many school gardens, especially those located far from reliable water sources. In response, in partnership with Baltimore City Public Schools (BCPS) and JHU Grounds, we are designing a **functional** and **interactive rainwater collection system** that provides water for school gardens while engaging students in hands-on learning about sustainability and conservation.

This project is supported by the *Campus as a Living Lab* grant at Johns Hopkins University.

Need Statement

Teachers/staff in BCPS need a **standalone rainwater collection** system because:

- 1. There is **inconvenient access** to water for their school gardens
- 2. It will **conserve water** and promote the concept to school communities

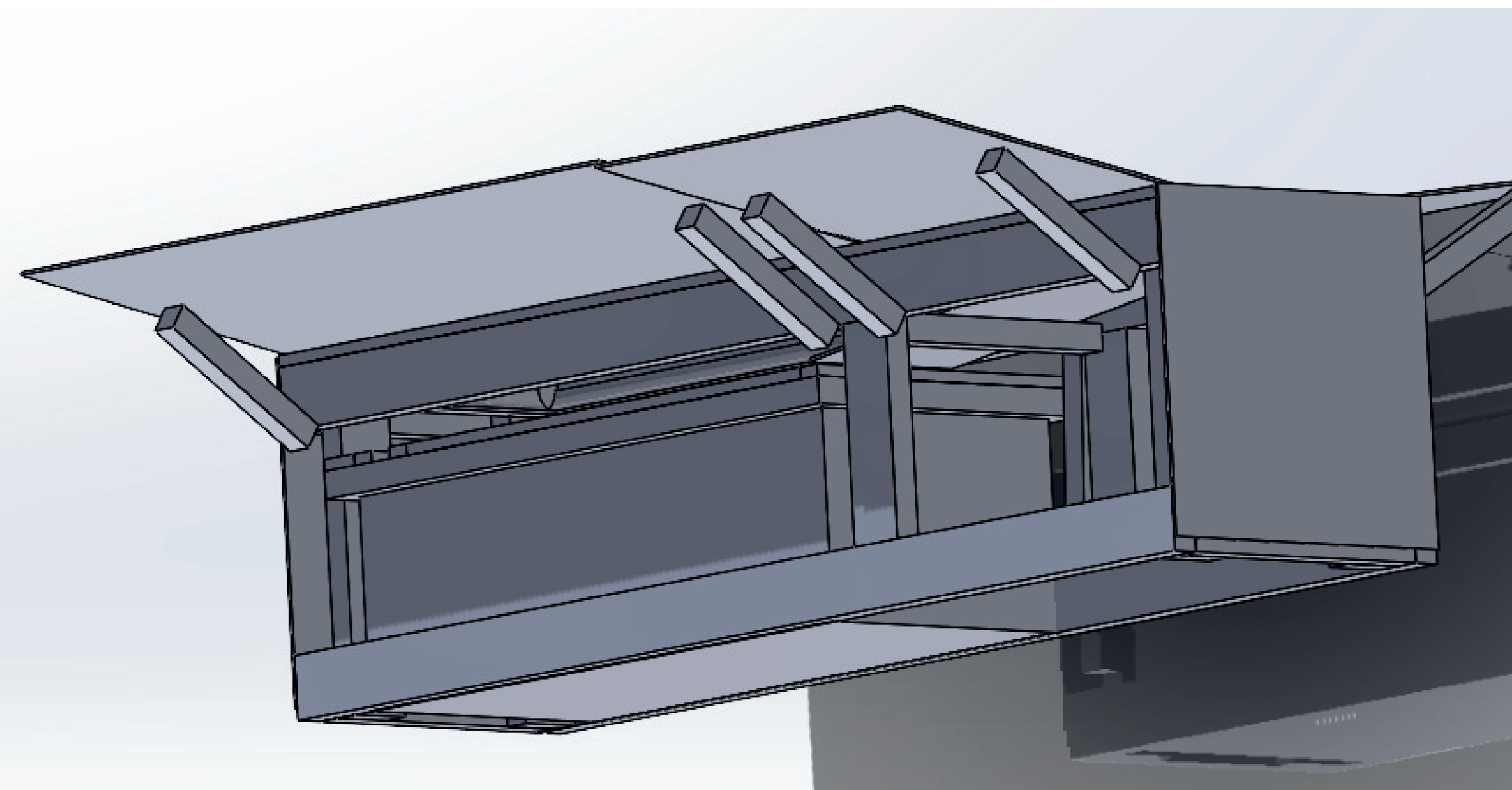
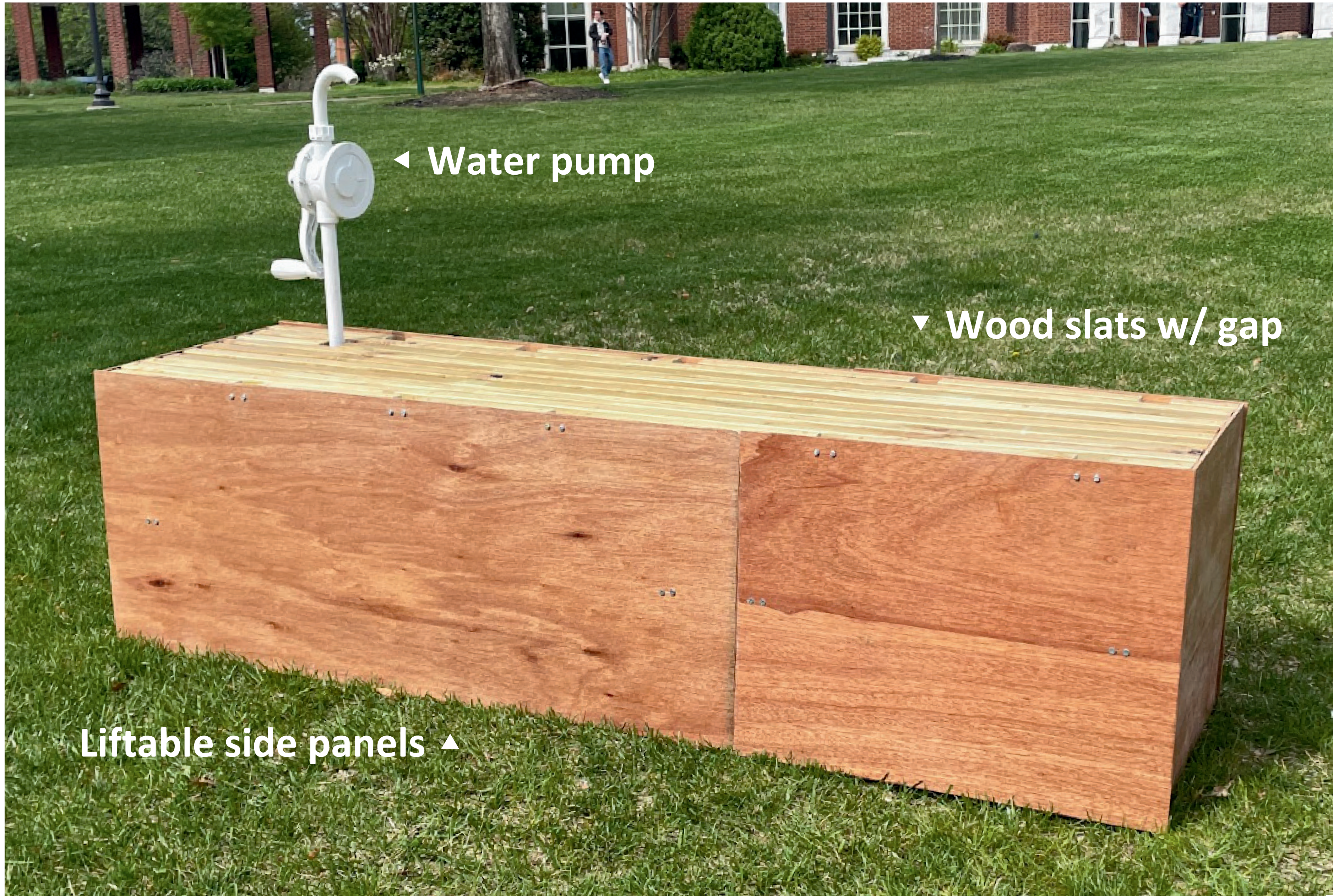
Criteria

Based on our research and synthesis, we developed eight criteria to evaluate prototype ideas and guide our final solution.

Collects water	Safe to use
Interactive	Easy to build/use
Durable	Free-standing
Affordable	Aesthetic

Final Solution

Our final solution is a rainwater-collecting bench designed to integrate seamlessly into any garden space. It functions both as a system for collecting and storing rainwater, and as a practical water source for teachers and gardening staff.



- How to use our solution:**
- 1) When it is raining, lift up the side panels on front and back to increase surface area.
 - 2) Rainwater will fall on the panel and bench top, and collect through the gaps of the slats.
 - 3) To access the water, use the hand crank to pump up collected & filtered rainwater.

Features



Side panels of the bench can be lifted and angled slightly to increase the surface area for rainwater collection.



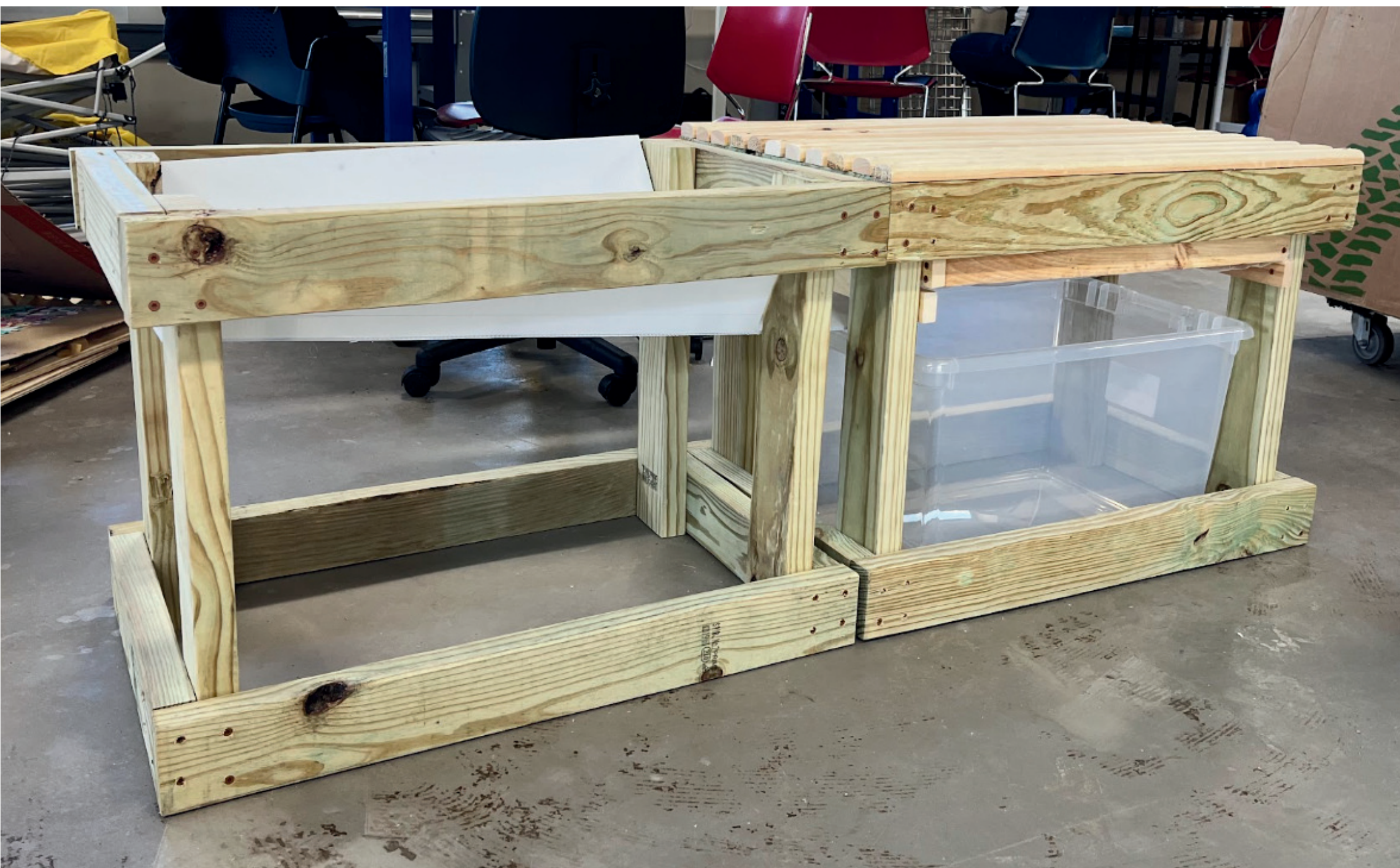
The **slope** inside the bench channels rainwater into the water tank, using the entire bench surface for collection.



A **removable filter** sits atop the water tank to catch large debris, reducing the risk of clogging the crank pipes.

The liftable side panels allows students to observe how the system works. By manually cranking the water up from the storage tank, students can engage directly with the bench—encouraging hands-on involvement in environmental activities and offering opportunities for interactive learning.

Past Prototypes



In our previous prototypes, we tested different bench dimensions and design features, and iterated based on how well they met our criteria.

Stats & Specs

~60%	Water collection efficiency
~1 GAL	# gallons collected per 1" of rain
\$ 445	Total cost of materials

We provide an **instruction manual** that lists materials and steps needed to build and assemble our solution.

