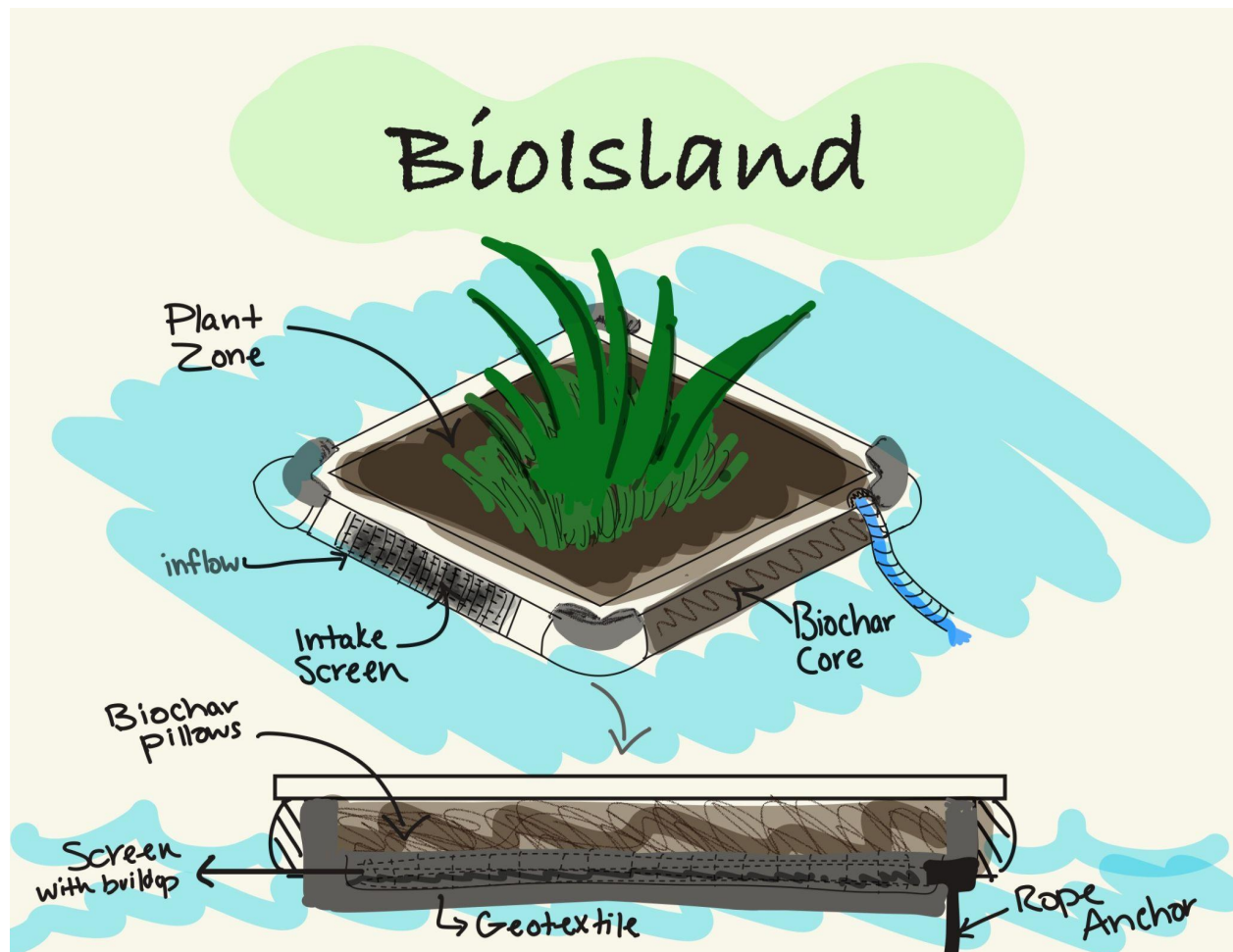


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Team Name: What We Grew
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Video Link:

https://instagram.com/p/DQI3LF-DAPG/?utm_source=qr



Script:

In my community and through my research, I've seen how water pollution has become a major issue, especially around Long Island Sound and nearby lakes. Being so close to NYC, my environment is constantly affected by urban runoff and manufacturing which have released pollutants like heavy metals, PFAS chemicals, and microplastics into the water. This pollution leads to algae blooms, fish deaths, and the loss of healthy aquatic habitats.

The natural process that inspired my idea is the self-cleansing system of wetlands. In wetlands, plant roots absorb nutrients, bacteria break down waste, and the soil naturally traps harmful chemicals before the water returns to rivers and bays. But because so many wetlands including Long Island have been destroyed by urban development, this natural filtration system is disappearing.

To bring this process back in a sustainable way, I designed Bioisland: a floating raft that mimics how wetlands clean water using modern, renewable materials. The key to my design is biochar, a highly porous carbon material made by heating agricultural waste. Biochar is important because it acts like a natural sponge: its tiny pores trap heavy metals, PFAS, and microplastics, while providing a surface where beneficial bacteria can grow and continue breaking down pollutants. It gives new life to discarded plant material and turns waste into a tool for environmental restoration.

This system works as polluted water first flows through intake screens that block debris, then moves into the biochar layer that filters and captures toxins. Next, it passes through a biofilm mat made from recycled plastic that holds bacteria to break down organic waste. Finally, it reaches the plant layer, where aquatic plants absorb extra nitrogen and phosphorus, preventing algae growth and restoring oxygen. As the water exits, it's cleaner and healthier for wildlife and people. Bioislands not only filters pollutants but also creates new habitats and shows how sustainable design can copy nature's own methods to solve modern environmental problems.