

Growing Futures: Marsh Grass Restoration Curriculum for Young Environmental Stewards

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Middle School Curriculum- Instructor Overview

- **Summary:** The Salt Marsh Scientists program is designed for middle school students and introduces them to the importance, biology, and conservation of salt marsh ecosystems. Students begin by exploring salt marsh grasses, their adaptations, root systems, and history in the Hampton Roads area while growing different types of grasses in class. They then investigate how salt marshes reduce erosion and flooding through experiments comparing grasses grown in soil, sand, and gravel. Students research salt marsh wildlife and create a classroom food web to understand species interdependence, energy flow, and the effects of species loss. The program also examines threats such as pollution, habitat destruction, and climate change, using GIS mapping tools to explore human impacts and develop conservation solutions. Students learn to propagate salt marsh grasses and observe their growth as a way to restore damaged ecosystems. Finally, students apply their knowledge through a hands-on restoration project, planting salt marsh grasses in a selected area and monitoring their progress over time.
- **Principles Alignment:** The program primarily aligns with Next Generation Science Standards (NGSS) for middle school, particularly the following principles:
 - MS-LS1-4: Students develop and use models to describe how plants and animals obtain and use matter and energy for growth and survival. This is addressed through studying salt marsh grasses, root systems, plant adaptations, and wildlife.
 - MS-LS1-5: Students construct scientific explanations based on evidence for how environmental and genetic factors influence the growth of organisms. This is addressed through grass propagation, growth experiments, ecosystem threats, and restoration activities.**Ecosystem Interactions:** Students explore food webs, species interdependence, energy flow, and the consequences of species loss within salt marsh ecosystems.
Human Impacts and Environmental Sustainability: Students investigate how pollution, habitat destruction, climate change, erosion, and flooding affect salt marshes and develop potential solutions.
- **Targeted Age:** Middle School
- **Estimated Length:** Six modules, 17 lessons total/50-minute lessons.
- **Estimated Cost:** Planting Containers, trays, cups and labels \$20-30, Potting soil, sand and gravel \$25-35, Seeds, Plugs or cuttings \$25-\$35 Printing costs \$20-30, total estimate \$90-\$130

Modules

1. Welcome to the Salt Marsh
2. Erosion Control Experiments
3. The Wonderful World of Salt Marsh Wildlife
4. Threats to Salt Marshes
5. Propagating Salt Marsh Grasses
6. Implementing the Restoration Project