UF|CPET

FFL Principle 8- Reduce Stormwater Runoff
Stormwater Effects on Water Quality
Middle School

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Program Type: Lesson Plan - Middle School	**Duration:** 3 days

Standards:

SC.7.E.6.6 Describe the effects of pollution (point and nonpoint sources) on water quality and aquatic ecosystems.

SC.7.L.17.1 Investigate and describe how environmental changes (such as pollution, natural disasters, or human activity) affect ecosystems.

SC.7.E.6.3 Explain the water cycle and how human activities, including stormwater runoff, affect water quality.

SC.7.N.1.5 Describe the importance of accurate and precise data collection and analysis in scientific investigations.

Learning Objectives: To identify key principles of Florida-Friendly Landscaping that help protect water quality.

Guiding Questions: How does stormwater pollution cause environmental changes?

Intended Outcomes

As a result of the program, what I want my audience to LEARN…	**As a result of the program, I want my audience to ACT by…**	**Assessment: (*How will you know* your audience has reached your intended outcomes)**
Students will explain the concept of stormwater runoff and its sources in urban and natural environments. Students will identify common pollutants found in stormwater and describe their potential impact on local water bodies and ecosystems. Students will explain how stormwater runoff affects the local ecosystems. Students will raise questions, create hypotheses and propose solutions for water quality	Students will conduct water quality tests on stormwater samples collected from local sites. Students will analyze and interpret water quality data to assess the health of stormwater and its effects on the environment. Students will investigate human activities in Florida that contribute to stormwater pollution and propose practical solutions to reduce contamination. Students will communicate their findings, demonstrating understanding of stormwater's role in water quality and ecosystem health	Develop an Environmental Impact (not as detailed) Report to present to peers and administration Lab Sheet

Schedule Layout:	**Items Needed:**
Day 1- Explore: Spark curiosity about stormwater and its impact on the environment. -Show a short video or images of stormwater runoff during a rainstorm in urban areas. -Ask students: • What happens to rainwater when it falls on streets, parking lots, or rooftops? • Where does this water go? • How might this water affect rivers, lakes, or oceans?	

Edited by Morgan Nielsen, Center for Precollegiate Education and Training, University of Florida

-Introduce the idea that stormwater can carry pollutants and affect water quality. ***-Homework:*** Have students collect samples from the water fountain, the retention pond and a local pond close to their home	
Day 2- Explain: Investigate local stormwater by testing water samples. -Provide students with water samples collected from different sources (e.g., tap water, pond, storm drain, rainwater). -Have students work in small groups to test key water quality indicators using simple kits or probes: ● pH level ● Turbidity (cloudiness) ● Temperature ● Dissolved Oxygen ● Presence of nitrates or phosphates (if available) -Students record their observations and measurements.	Sample of Clean Water Sample of Retention Pond Water Sample of Mystery Water Test kit from Carolina Biological or similar
Day 2 or 3: Elaborate- Understand how stormwater affects water quality and ecosystems -Discuss what each water quality indicator means and why it matters: ● pH affects aquatic life health ● Turbidity indicates sediment or pollution levels ● Temperature impacts oxygen levels in water ● Nitrates/phosphates can cause algae blooms -Relate findings from their water tests to potential stormwater pollution sources (e.g., fertilizers, oil, trash). -Compare results to Florida Department of Environmental Protection Acceptable Limits -Introduce the concept of nonpoint source pollution carried by stormwater runoff.	
Optional: Invite Guest Lecturer from IFAS Mike Clark or AJ Reisinger	
Day 3/ Homework: Evaluate- Assess Student Understanding and Application of Concepts -Have students create a mock environmental impact report -Reflection Questions: ● What did you learn about stormwater and its effects on water quality? ● How can water testing help us understand pollution? ● What are some ways to reduce stormwater pollution?	Computers
Present report to class and class visitors	Computer/Projector