



Elementary and Middle School Virtual Stormwater Management Curriculum

Day 1: Human Impact on Watersheds

- Pre-test
 - Baseline to assess what students already know about stormwater management
 - Pre-test document: see attached curriculum lessons folder
- Middle school student activity: Natural and Urban Water Cycle PowerPoint and Fill-in-the-Blank Worksheet
 - Use this presentation and accompanying worksheet to review the different parts of the water cycle with your students. These materials will also help you explain that urban land use impacts the hydrologic cycle.
 - PowerPoint:
https://www.teachengineering.org/content/usf/_lessons/usf_stormwater/usf_stormwater_lesson01_presentation_v3_tedl_dwc.pdf
 - Water Cycle Worksheet: see attached curriculum lessons folder
 - Water Cycle Worksheet Answer key: see attached curriculum lessons folder
- Crumpled Watershed Model
 - This activity will introduce the concept of a watershed to students using common objects found at home, like computer paper and markers.
 - <https://water.unl.edu/documents/Crumpled%20Watershed%20Model%20opt.pdf>
- Recorded EnviroScape presentation about watersheds
 - This recording of a live watershed demonstration will build off of the “Crumpled Watershed” activity and teach students:
 - 1) what a watershed is
 - 2) the difference between point source and non-point source pollution
 - 3) the different types of non-point source pollutants that people unknowingly contribute to local rivers and streams.
 - https://drive.google.com/file/d/1Wf6Zo-aYRb4pA_cOP1fR0IqUh2WVsUd4/view?usp=sharing

Day 2: What is stormwater?

- Elementary school student activity: Freddy the Fish Teaches about Stormwater
 - Use this video to introduce the concept of stormwater runoff and the effects that pollution has on wildlife habitat.
 - <https://www.youtube.com/watch?v=jjPfLhJbdc0>
- Elementary and middle school student activity: "Only Rain in the Storm Drain" Video
 - Use this video and the accompanying worksheet to introduce the concept of stormwater runoff so students understand that only rainwater should be flowing into the storm drain.
 - "Only Rain in the Storm Drain" Worksheet: see attached curriculum lessons folder
 - <https://www.youtube.com/watch?v=LsBKpArM-v0>
- Stormwater Crossword Puzzle
 - Fun activity to reinforce stormwater management vocabulary
 - https://www.nassauswcd.org/uploads/8/0/9/9/80996798/stormwater_crossword_puzzle.pdf

- Middle school student activity: "Stormwater Pollution and Green Infrastructure Solutions" Video
 - In this video produced by the Nassau County Soil and Water Conservation District and the New York State Department of Environmental Conservation, students will learn what stormwater runoff is and how we can effectively manage it using nature-based stormwater solutions. Use the accompanying worksheet to ensure that your students understand the most important concepts of the film.
 - <https://www.youtube.com/watch?v=ATNy-vaIPXI>
 - "Stormwater Pollution and Green Infrastructure Solutions" Worksheet: see attached curriculum lessons folder
- Middle school student activity: Green Infrastructure PowerPoint and Worksheet
 - Use these materials to introduce students to the wide-range of green infrastructure options.
 - PowerPoint: https://www.teachengineering.org/content/usf_/lessons/usf_stormwater/usf_stormwater_lesson02_presentation_v2_tedl_dwc.pdf
 - Green Infrastructure PowerPoint Worksheet: see attached curriculum lessons folder
- Impervious Surfaces Lab
 - Using water and a plastic water bottle, students will learn about pervious and impervious surfaces and will determine the different infiltration rates depending upon the surface the water is flowing over.
 - Through extension activities and group discussion, students will learn that there are flooding and pollution implications of having too many impervious surfaces in a given community.
 - Impervious Surfaces Lab and Student Recording Sheet: see attached curriculum lessons folder

Day 3: Stormwater Home Inventory

- Stormwater Runoff Online Simulator
 - Model created by Stroud Water Research Center to demonstrate different infiltration, evapotranspiration, and runoff volumes on selected land cover types.
 - Used to show students the effects of land cover and soil type on the volume of stormwater runoff.
 - <https://runoff.modelmywatershed.org/>
 - Runoff Simulation User Guide: see attached curriculum lessons folder
- Stormwater Walk Activity
 - Students will use the attached activity sheet to tally the different features in their yards that affect stormwater runoff and then determine an overall score that will indicate whether their yards are already managing stormwater effectively or if their yards can use some improvement to better manage stormwater runoff.
 - <https://water.unl.edu/documents/Stormwater%20Walk%20opt.pdf>
- Site inventory of their homes
 - Students will observe the conditions around their homes and create a map of the specific features of their properties that would affect stormwater runoff.
 - Students should make note of where the water is currently flowing, the location of trees and other types of vegetation, areas with shade and sunlight, wildlife habitat, any hills or changes in elevation, impervious surfaces (driveways, decks, pavers, rooftops), and the location of their gutters and downspouts.
 - How-to Directional Video for Yard Site Inventory: <https://drive.google.com/file/d/1yGbTCRFP7v9dtnsTiPkj3Y4x1yBYxo80/view?usp=sharing>

- Sample Yard Site Inventory: see attached curriculum lessons folder

Day 4: Propose Your Own Stormwater Management Strategy

- The Interactive Yard
 - Through this interactive computer program, students will be able to select which features they would like to add to/subtract from the lawn-dominated yard to improve it for both wildlife habitat and stormwater management.
 - Students will learn about different stormwater best management practices as well as different types of native and invasive plants.
 - <https://www.jerseyyards.org/create-a-jersey-friendly-yard/the-interactive-yard/>
- Webquest
 - Through this activity, students will work independently and explore the different pages of the Jersey Yards website in order to strengthen their understanding of stormwater management strategies, types of native plants for rain gardens and pollinator habitat, and pollutant policies in New Jersey.
 - Webquest Worksheet: see attached curriculum lessons folder

Day 5: Green Infrastructure Design Challenge

- Green infrastructure design challenge: Students will work in small groups to propose stormwater management solutions for the provided images. To do this activity in a virtual setting, students can work individually and then either share their solutions with the class electronically or through a live, virtual classroom update.
 - A proposed green infrastructure solution should take into account its cost, effectiveness, and ability to meet the needs of people and animals.
 - Green Infrastructure Design Challenge Instructions: see attached curriculum lessons folder
 - Green Infrastructure Design Challenge Images: see attached curriculum lessons folder
- Post-test
 - Repeat the same assessment from the beginning of the week so students can demonstrate how much they learned.
 - Post-test document: see attached curriculum lessons folder