Understanding the Urban Watershed Curriculum
Fairmount Water Works
Why Water?

• Need/Love of water
• Public health
• Cities engineer collective systems (public works)
• Stormwater management – green stormwater infrastructure for the city (home, school, business, visitors)
• Understand and protect our water supply
Map of Pennsylvania
Historic Streams
Map of Philadelphia

Philadelphia’s Remaining Streams
Urban Water Use Cycle
Fairmount Water Works c 1830s
Fairmount Water Works: The Center Now
Discover
Connect
Act
Philadelphia Row Homes
Where the rain flows...

in Natural vs. Urban (Impervious) Settings

- Stormwater infiltrates into the ground
- Plants and trees work to absorb stormwater

- Water hits impervious surface and runs off roofs, streets, parking lots etc.
- Runoff goes into the sewers
WET WEATHER

- Downspout
- Sewage
- Stormwater Inlet
- Sewage Pipe
- Dam
- Outfall Pipe

Stormwater, diluted sewage and pollutants overflow into rivers

Sewage to Treatment Plant
We’re Not Alone

- 772 Communities across 32 states use combined sewer systems
PWD Green City, Clean Waters
“Triple Bottom Line”

**Social Benefits**
- Recreation
- Aesthetics
- Public Health
- Equity

**Environmental Benefits**
- Fishable & Swimmable
- Habitat Enhancement
- Air Quality
- Energy Savings
- Carbon Footprint

**Economic Benefits**
- Property Values
- Job Creation
- Competitive City

Advantages of the Green Approach
Green Schools
Understanding the Urban Watershed: The Curriculum Framework

• 10 years in the making; compilation of tested activities and themes
• Logical next step for us; classroom to schoolyard connection
• Interest in enlivening the urban story—focus on water for cities/urban infrastructure systems and how/why they developed FOR PEOPLE in the classroom
• Advisory Board: FWWIC, PWD Office of Watersheds, Partnership for Delaware Estuary, EcoExpress, PP and R, GFS (CCSS Literacy); Bryn Mawr College (CCSS Math), US Forest Service (Sustainability Fellow ‘12)
• Partial funding from EPA; pre-pilot at Nebinger
• 2013-14 Pilot at Nebinger and Greenfield Elementary
• 2014-15 Green Schools Classroom to Schoolyard Connection
How the Narrative Unfolds?

Thematic Unit 1: Water in Our World

Thematic Unit 2: Land and Water: A delicate balance (or Can’t We All Just Get Along?)

Thematic Unit 3: Drinking Water and You

Thematic Unit 4: Green Plan for the Future: Playing a Part

Thematic Unit 3: Down the Drain, or Out of Sight, Out of Mind

Thematic Unit 5: Environmental Stewardship
Curriculum Overall Learning Objectives

Students Will:
• Grow to understand why the schoolyard projects are important and will want to take care of them
• Have a healthy environment that makes environmental “sense”
• Play a role in the larger urban story
• Engage in learning through an integrated approach to learning (which helps things “stick”)
• Develop critical and creative thinking
• Will master skills required by Literacy, Math and Science Benchmarks for Standards
Curriculum: The Guide

• What it is! A working framework to guide you through lessons and activities
  ▪ Thematic Units 1-5 (Objectives; What you Should Know)
  ▪ Sequential Lessons within Thematic Units
  ▪ Suggested Vocabulary/Activities/Discussion topics
  ▪ Connections to Common Core State Standards in Literacy and Math (Reading, Writing, Speaking and Listening); Next Generation Science Standards (pending)

• What it is *not*: Lesson plans and activities to download/photocopy
Curriculum: Resource Support

• Content Support: PWD and its Partners
  - Expertise to support the classroom lessons and activities: environmental educators, PWD and Partner scientists, engineers, policy makers (College student teams up with teacher)

• Teacher Toolbox: Online (resourcewater.org)
  - Content support
  - Classroom media
  - History of Water in Philadelphia
  - https://resourcewater.org
Curriculum: Powerful STEM opportunities
Fairmount Water Works Field Trips Place-based learning
Field Trip Experience Along the Riverbank
and on the water...
Classroom to Schoolyard Connection
Cross disciplinary
3-year Teacher Fellowship Program to write Middle Years Curriculum supported by the William Penn Foundation
Intensive Professional Development around *Understanding the Urban Watershed*

- Teacher written- teacher driven curriculum
- Powerful learning
- Content support/pedagogy/lesson planning and piloting in the classroom
- Connect to real world learning /resources
- Standards-based (Common Core/NGSS)
- Progressive and innovative
Curriculum Connections– Get outside
For more information...

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