

Educational resources for the classroom inside and outside of school

The Jersey Water Works Community Engagement Committee worked with a New Jersey Future intern to compile educational resources on water infrastructure that can be used inside and outside of school. We separated the content by what we thought would be most useful for inside and outside of the classroom. Videos, for example, are in the section for outside of the classroom but could be used to supplement a classroom lesson as well. In addition, there are sets of activities for students across grades, which have been further subdivided into categories: Non-Point Source Solutions; Stormwater; Water Cycle; Water Supply and Wastewater; Watershed; Water Quality; and Miscellaneous.

This list of education resources on water infrastructure was pulled from New Jersey, New York and Pennsylvania. The information has been gathered from [Project WET, NJDEP](#), [NYCDEP Environmental Education](#), [Penn State Extension](#), [EPA](#) and [EcoExpress](#).

Resources for outside the classroom, by subject:

1. Drought:

Project WET Discovering Drought Lesson Plan (Grade 3 - 6):

<http://www.projectwet.org/sites/default/files/content/documents/drought-lesson-plan.pdf>

2. Non-Point Source Solutions:

Options (Grade 9 - 12): <http://www.nj.gov/dep/seeds/strmwtr/options.pdf>

Getting to the Source (Grade 5 - 8): <http://www.nj.gov/dep/seeds/strmwtr/source.pdf>

Storm Drain Survey (Grade 9 - 12): <http://www.nj.gov/dep/seeds/strmwtr/sdsurvey.pdf>
<https://extension.psu.edu/>

3. Stormwater:

Modeling Stormwater Runoff (Grade 4 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/lesson-modeling-stormwater-runoff.pdf

Soil Infiltration: What Is a Bioswale? (Grade 4 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/lesson-soil-infiltration-what-is-a-bioswale.pdf

Educating the Public- (Grade 6 -12):

http://www.nyc.gov/html/dep/pdf/environmental_education/lesson-educating-the-public.pdf

Storm Drain Watch (Grade 3 - 4):

<http://www.nj.gov/dep/seeds/strmwtr/sdwatch.pdf>

Rain to Drain- Slow the Flow PennState Extension (Middle School):

<http://extension.psu.edu/4-h/leaders/resources/publications/rain-to-drain-slow-the-flow>

4. Water Cycle:

The Movement of Water (Grade 3 - 4): <http://www.nj.gov/dep/seeds/strmwtr/move.pdf>

Thirstins Water Cycle Activity (Grade K - 3):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_k-3_watercycle.pdf

Thirstins Wacky Water Adventure (Grade K - 3):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_k-3_activitybook.pdf

New York City Water Cycle Rain Dance (Grade K - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/lesson-nyc-water-cycle-rain-dance.pdf

Drop Pass (Grade K - 2): <http://www.nj.gov/dep/seeds/strmwtr/drop.pdf>

Save Water Every Drop Counts (Grade K - 6):

<http://www.state.nj.us/dep/seeds/docs/everdropcounts.pdf>

5. Water Supply and Wastewater

I Spy Water (Grade 2 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/lesson-i-spy-water.pdf

Waste Water Treatment (Grade 6 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/lesson-wastewater-treatment.pdf

Map Resource Guide for Teachers-New York City's Water Story: From Mountain Top to Tap (Grade 6 - 8):

http://www.nyc.gov/html/dep/pdf/environmental_education/new-york-citys-water-story-teachers-guide.pdf

Neighborhood Water Features (1 - 5):

http://www.nyc.gov/html/dep/pdf/environmental_education/activity-neighborhood-water-features.pdf

EPA Environmental Education: Where Does Your Water Comes From? (Grade 4 - 8):

https://www.epa.gov/sites/production/files/2016-03/documents/activity_grades_4-8_where_water_comes.pdf

Resource Management: Protecting Your Drinking Water (Grade 9 - 12):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_9-12_resourcemanagement.pdf

6. Watershed:

A Community Watershed (Grade 7 - 12):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_CommunityWatershed.pdf

Topo Twister (Grade 7 - 12):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_StateWatershed.pdf

Thirstin Builds an Aquifer: Aquifer in a Cup (Aquifer on the Go) (Grade K - 3):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_k-3_aquiferinacup.pdf

Youth Activity: How People Get Their Water—Reservoirs: “Holding Tanks” for Drinking Water (Grade 4 - 8):

https://www.epa.gov/sites/production/files/2016-03/documents/activity_grades_4-8_howpeoplegetwater.pdf

Thirstin’s Ground Water Movement Activity (Grade K - 3):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_k-3_groundwatermovement.pdf

Build Your Own Watershed (Grade 8 - 12):

https://www3.epa.gov/safewater/kids/activity_grades_9-12_buildyourownwatershed.html

How Watersheds Work (Grade K - 2): <http://www.nj.gov/dep/seeds/strmwtr/hwwork.pdf>

A Dynamic Watershed (Grade 5 - 8):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_DynamicWatershed.pdf

A Changed Land (Grade 6 - 8):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_ChangedLand.pdf

The Nature of Imperviousness (Grade 6 - 8):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_Imperviousness.pdf

7. Water Quality:

Water Quality Matters: 4 H Water Project-Unit 3 (Grade 8 - 10):

<http://extension.psu.edu/4-h/leaders/resources/publications/do680a-the-4-h-water-project-unit-3-water-quality-matters-unit-3.pdf>

8. Miscellaneous:

Measuring Slope Around School (Grade 8 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/lesson-measuring-slope-around-school.pdf

Environmental Protection Agency-Environmental Education-The Role of Plants in Water Filtration (Grade 4 - 8):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_4-8_plantsinwaterfiltration.pdf

Decision Making-A Mock Town Meeting on a Proposed Tank Farm (Grade 9 - 12):

https://www.epa.gov/sites/production/files/2016-03/documents/activity_grades_9-12_proposedtankfarm.pdf

VIDEOS:

These are video tutorials for students across age groups. Most of the videos are local case studies that educate students about water challenges around them.

1. Rainwater:

Rain Gardens: Saving Streams One Yard at a Time (Grade 8 - 10):

http://www.ecoexpress.org/video_detail.php?videoId=163¬es=0,0,1,0

Capturing Rainwater is Good Business Practice (Grade 5 - 7):

http://www.ecoexpress.org/video_detail.php?videoId=170¬es=0,1,0,0

2. Stormwater:

Bio- Retention Island (Grade 11 - 12):

http://www.ecoexpress.org/video_detail.php?videoId=167¬es=0,0,0,1

Stormwater Bump-outs: Calming a Community while Protecting the Creek (Grade 11 - 12):

http://www.ecoexpress.org/video_detail.php?videoId=183¬es=0,0,0,1

Green City, Clean Waters (Grade 11 - 12):

http://www.ecoexpress.org/video_detail.php?videoId=158¬es=0,0,0,1

Streamside Forest Buffers: Improving Water Quality (Grade 11 - 12):

http://www.ecoexpress.org/video_detail.php?videoId=168¬es=0,0,0,1

Percy Street Goes Green: Another Philadelphia First (Grade 11 - 12):

http://www.ecoexpress.org/video_detail.php?videoId=164¬es=0,0,0,1

3. **Watershed:**

The Watershed Connection: East Falls (Grade 8 - 10):

http://www.ecoexpress.org/video_detail.php?videoId=181¬es=0,0,1,0

4. **Miscellaneous:**

Healthy Urban Waters: Empowering People, Improving Communities, Creating Jobs (Grade 8 - 10):

http://www.ecoexpress.org/video_detail.php?videoId=182¬es=0,0,1,0

Water Cycle (Grade 3 - 6): <http://video.projectwet.org/incredible-journey/>

Resources for inside the classroom:

LESSON:

These lessons are arranged in Water Conservation, Water Supply, Watershed and Miscellaneous categories. The lessons not only teach concepts and skills to students, but also provide appropriate background information for teachers.

1. **Water Conservation:**

Water Conservation With the Water Lion—the 4-H Water Project Unit 1 (Age 8 – 11):

<http://www.water-research.net/Waterlibrary/privatewell/waterconservation.pdf>

Water With the Water Lion—4-H Water Project Unit 2 (Age 8 - 11):

<http://ecosystems.psu.edu/youth/sftrc/lesson-plan-pdfs/incrediblewater>

2. **Water Supply:**

The Water We Drink (Grade 6 - 12):

<http://extension.psu.edu/natural-resources/water/youth/drinking-water/the-water-we-drink>

3. **Watershed:**

NJ WATERS: A Watershed Approach to Teaching the Ecology of Regional Systems (Grade 6 - 8):

<http://www.njaudubon.org/SectionEducation/NJWaters/NJWATERSLessons.aspx>

Clean Water Book: Choices for Watershed Protection (Grade Not Specified):

http://www.nj.gov/dep/watershedrestoration/waterbook_tble.html

4. **Miscellaneous:**

Hudson River Estuary Climate Change Lesson Project (Grade 5 - 8):

<http://www.seagrant.sunysb.edu/hriver/pdfs/climatechange/HudsonRiverEstuaryClimateChangeLessonProject.pdf>

4 H Project: Unit 3-Supplement Riparian Buffers (Age 5 - 19):

<http://extension.psu.edu/4-h/leaders/resources/publications/BUFFers.pdf>

WORKSHEETS:

This section consists of worksheets such as crosswords, fill-in-the-blanks, match the words, and Sudoku. The curriculum is organized in the categories of Wastewater, Water Cycle, Water Supply, and Watershed.

1. Wastewater:

Sewer Sudoku (Grade not specified)

http://www.nyc.gov/html/dep/pdf/environmental_education/worksheet-sewer-sudoku.pdf

Grease Crossword Puzzle (Grade 6 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/activity-grease-crossword-puzzle.pdf

Wastewater Treatment Crossword Puzzle (Grade 6 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/activity-wastewater-treatment-crossword-puzzle.pdf

Secrets of New York: The Sewers (Grade 6 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/worksheet-secrets-of-new-york-the-sewers.pdf

2. Water Cycle:

The Water Cycle—Where Does Water Come From, and Where Does It Go? (Grade 3 - 6):

http://www.discoverwater.org/resources/Water_Cycle_Educator_Resources.pdf

Word Scramble (Grade 4 - 8):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_4-8_wordscramble.pdf

3. Water Supply:

How Does Water Flow in NYC? (Grade 6 - 12):

http://www.nyc.gov/html/dep/pdf/environmental_education/worksheet-how-does-water-flow-in-new-york-city.pdf

Matching Game: How Much Water? (Grade 4 - 8):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_4-8_funfactsmatchinggame.pdf

4. Water Pollution: Tracking Pollution A Hazardous Whodunit (Grade 9 - 12):

https://www3.epa.gov/safewater/kids/pdfs/activity_grades_9-12_trackingpollution.pdf

5. Watershed:

Estuary: Group A Data Form: Water Characteristics (Grade 7 - 12):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_StateWatershed_estuary.pdf

Pond/Lake: Group A Data Form: Water Characteristics (Grade 7 - 12):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_StateWatershed_pond.pdf

Freshwater Stream/River: Group a Data Form: Water Characteristics (Grade 7 - 12):

http://www.njaudubon.org/Portals/10/Education/PDF/NJ%20WATERS/NJWATERS_StateWatershed_freshwater.pdf