

Featured Career Opportunities

Chemist

Chemists study the properties of matter and understand the behavior and interactions of molecules, electrons, and ions. A water chemist has a complicated subject to study because water can dissolve almost every other substance on earth. Water also behaves differently in different conditions. Water's chemistry can cause pipes to corrode or to become so full of scale that they clog shut. Water agencies employ chemists to:

- Study the characteristics of the raw and treated water of that particular agency;
- Determine how the soil, roads, and developments near a water supply affect the water chemistry.

Requirements:

- Four year or graduate degree in chemistry. Excellent science and laboratory skills; attention to detail; strong critical thinking skills.



Laboratory Technician

Laboratory technicians are trained in using chemical and biological tests and procedures. In the water quality industry, lab technicians help the chemist, microbiologist, water quality specialists, and treatment plant operators. They are responsible for:

- Measuring the level of microorganisms in source water and treated water.
- Measuring water quality conditions such as pH, turbidity, and hardness.
- Reporting results to chemists and other specialists.

Requirements:

- On-the-job training or two or four year degree in lab science. You must have an interest in science, be skilled at using laboratory equipment, organized, able to follow procedures accurately and do outdoor work.



Water Quality Specialist

A water quality specialist has two areas of concern. The first concern is *raw water*, which is water in nature that is part of the water supply. The second concern is *treated water*, which is water that has been filtered and disinfected at the treatment plant. Water quality specialists study how water quality affects human health. They also consider the long-term "health" of the pipes in the distribution system. Their work often overlaps with that of the chemist and chemical engineer. Water quality specialists study:

- How activities and structures around a water supply affect the water quality.
- What happens to water quality in the distribution system after it leaves the treatment plant.

Requirements:

- A four year degree in chemistry, earth science, biology and other related sciences. You must have a love for the outdoors, good science skills, strong communication skills, and good critical thinking skills.

If you fit these qualifications, then these are rewarding careers for you! For more exciting career opportunities, go to www.wef.org/membershipcareers/JobResources/Career-Paths.



Microbiologist

Microbiologists study the life(biology) of organisms that are too small to see without a microscope. Some of these microscopic organisms can cause serious or deadly diseases in people. Keeping these organisms out of the water supply is a major concern for water agencies. Microbiologists use microscopes, chemical tests, and other diagnostic techniques to screen the water for dangerous microorganisms. Their duties include:

- Conducting microbiological and chemical tests for monitoring and controlling water quality in reservoirs, lakes, treatment plants, and the drinking water distribution.
- Isolating and identifying bacteria found in the water.
- Interpreting and evaluating results

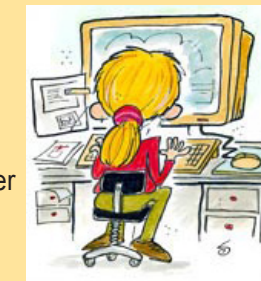
Requirements:

- A four year or graduate degree in microbiology, biology, or related field. You must be a problem-solver, have an attention to detail; good communicator, excellent science and research laboratory skills; attention to detail; strong critical thinking skills.

Competitions for Students

- **Name the Next NASA Mars Rover** - Open to K-12 students in the US and in schools for American personnel overseas. Prizes include a trip to NASA's Jet Propulsion Laboratory in California. Go to <http://marsrovername.jpl.nasa.gov/>
- **Engineering Innovation Essay Contest** - Ever wondered what goes through an engineer's mind when designing a new product? It takes creativity as well as attention to details and design requirements. Evaluate your own engineering product. Essay contest is sponsored by the National Academy of Engineering's EngineerGirl! program, open to both girls and boys in various age groups. Go to <http://www.engineer-girl.org/?id=10104>
- **Intel International Science and Engineering Fair (Intel ISEF)** - The world's largest international pre-college science competition provides a forum for high school students worldwide to showcase independent research. Open to students grades 9-12. Go to <http://sciserv.org/isef/>
- **'No Boundaries' Competition**- NASA-USA Today collaboration helps students explore careers in science, technology, engineering and math. Win cash awards and VIP passes to a NASA shuttle launch. Deadline is May 15, 2009. Go to: <http://www.noboundaries-stemcareers.com/>
- **6th Annual Digital Photo Competition** - Open to all K-12 students. Capture and share your unique vision of the world; you can also digitally enhance photos with imaging software. Best digitally enhanced photo wins a special prize from Adobe. Other prizes include a digital camera, Adobe Photoshop Elements, and more. Go to <http://www.techlearning.com/portraits/>
- **Technology Student Association** - This nationwide organization holds competitions for high school and middle school students. Go to <http://www.tsaweb.org/Competitions>

Websites of Interest



www.nywea.org - Website of the New York WEA

www.nyweametro.org - This is the Metropolitan chapter website of the New York Water Environment Association.

www.dec.ny.gov - The New York State Department of Environmental Conservation has launched a new electronic newsletter for families. It is called *DEC Outdoor Discovery*. Each issue introduces subscribers to a seasonal environmental or nature topic, suggests a related activity, and lists family-friendly events at DEC's environmental education center. To subscribe, go to the website above and click on DEC Outdoor Discovery.

www.epa.gov/teachers - This is EPA's newly revised and improved environmental education website for teachers. One new feature is the addition of grade levels for the cited classroom materials.

[Http://www.epa.gov/fishadvisories/kids](http://www.epa.gov/fishadvisories/kids) - EPA website for kids.

www.teachengineering.com - Teach Engineering is a multi-university partnership that has developed K-12 engineering education curriculum modules that are standards-based, free and available over the internet. It aims to equip teachers with lessons in science, math and engineering that are creative and exciting.

[Http://science.nsta.org](http://science.nsta.org) - National Science Teachers Association newsletter. Each issue is filled with informative articles.

[Http://www.wef.org/LearnAboutWater/ForEducators/CurriculumMaterials/](http://www.wef.org/LearnAboutWater/ForEducators/CurriculumMaterials/). The Water Environment Federation has many children's publications including *Water the Amazing Journey* "Go With The Flow, and *World-wide Waste, It's not a Load of Rubbish*.

www.engineeringk12.org - Go Engineering's e-newsletter is for K-12 educators. Its purpose is to promote the importance of engineering and technology education and to explore the many ways that engineering and technology can help teachers meet the challenge of making mathematics and science come alive for students.

Water Is Life, and Infrastructure Makes It Happen™ educational program is encouraging teachers to take advantage of a recently released documentary to teach about water infrastructure. *Liquid Assets The Story of our Water Infrastructure*, originally a 90 minute documentary project produced by Penn State Public Broadcasting is now available with educational materials through www.TeachersDomain.org. The program is free of charge and includes video segments, a background essay, discussion questions, and academic standards correlations. Six topics are offered:

- Community Participation/Activism
- Sustainable Water Use
- Wastewater
- Public Health
- A Water System
- Watersheds

For additional background information and a schematic showing "what's beneath our feet" visit www.WaterIsLife.net.



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**Upcoming Events -
 Mark your Calendar!
 NYWEA Spring
 Technical Conference
 & Exhibition**
June 1-3, 2009
**Hotel Thayer, West
 Point**

Leading the Way in Water Quality Management

Classroom Activities

Attention teachers — here's an idea for a class project to help get students thinking about engineering.

Remove Pollutants from Water

This lesson will take 2-3 class periods of 40 minutes each. The goal is for students to figure out how to collect the steam from boiling "polluted" water and then let it condense in a new container. Ideally, the new, condensed water will be pure because any particles originally contained in the boiling water would be left behind as it turned into steam.

More information can be found in the December 16, 2008 Go Engineering Newsletter published by the American Society of Engineering Education.

World Water Monitoring Day - September 18, 2009

Last year, over 70,000 people monitored their waterways for World Water Monitoring Day. For more information on World Water Monitoring Day, go to wwmd@wef.org.



Turn kids on to engineering: Visit ASCEville

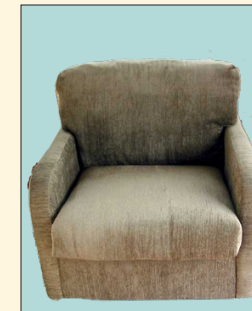
Bring the kids you know to a fun "town" that exposes them to the vital role civil engineering plays in their lives every day, and the exciting, creative and rewarding ways in which civil engineers make those happen. ASCEville has launched online, featuring interactive activities, compelling stories of inspiring young engineers, and engaging graphics, all designed to appeal to kids in grades 4-7. Educators, parents and engineers will find outreach and teaching resources, as well as valuable information about the history of civil engineering, civil engineering disciplines, and preparing kids for civil engineering careers. The new site is part of a developing suite of ASCE Pre-College Outreach resources that present the profession in engaging and age-appropriate ways. Visit ASCEville today!



EnviroEd

Spring 2009

PUBLISHED BY THE PUBLIC EDUCATION COMMITTEE OF THE NEW YORK WATER ENVIRONMENT ASSOCIATION, INC.
www.nywea.org



Message From the Chair

The NYWEA Public Education Committee publishes this newsletter twice a year to engage young

people in careers related to water quality such as engineers, biologists, chemists, treatment plant operators, managers, laboratory technicians, government officials and many others. In an effort to improve the newsletter and make it more useful to our readers, the NYWEA Public Education Committee has decided to feature career opportunities in each issue.

In this edition of our newsletter, you will see very important career paths outlined, some fun classroom activities many links to interesting educational web sites. We hope you find this newsletter interesting and worthwhile. If you do not find this information interesting, we hope you will contact us with your ideas on how we can provide information to promote the water quality profession as a career path for young students. Please e-mail Beth Petrillo directly at bpetrillo@dep.nyc.gov.

Featured Careers this issue:

- **Chemist**
- **Microbiologist**
- **Laboratory Technician**
- **Water Quality Specialist**

Spotlight on Schools

Dacula Middle School, Georgia

The Dacula Middle School has students pretend to be the crew of the spaceship USS Innerpride, based on the Star Trek television series. Under their teacher's guidance, the students solve algebraic problems to complete activities such as "damage reports" following attacks from aliens.

Essex Elementary School, Massachusetts

First-graders are engineers – with Legos. Legos and laptops are used to teach the engineering design process to the school's first and second graders. The students use a picture-based programming software, Robolab, to program Lego cars to perform a series of tasks.

Wheeler Elementary School, Kentucky

A new partnership at Wheeler Elementary School will give additional students access to a popular engineering program, both during and after the school day.

Officials with Jefferson County Public Schools announced that Qk4 Architecture Engineering Planning has made a commitment to sponsor an Engineering is Elementary classroom at Wheeler over the next five years. The program, now in its third year, unites faculty and students at the University of Louisville's J.B. Speed School of Engineering with students involved in Wheeler's Engineering Club. The program incorporates literature and science- and math-based content as the children engage in hands-on exploration and creative problem-solving within the engineering field.

"The whole purpose of the program is to have kids apply the things they are learning in math, science and technology," Wheeler principal Julie Barrett said. "This program is so popular at our school -- we've had kids knocking at the door, wanting to participate in this."

Students will have opportunities to work with professional engineers. Students learn that the skills taught to them every day in math, science and technology can truly be applied to the real world. Getting young children interested in math and science has the promise of building a future pool of educated and qualified technical professionals.

The program "captures students' enthusiasm at an early age, with the aim of interesting them in an engineering career and in the workings of everyday things they may take for granted. The Engineering is Elementary Program is available at five elementary schools -- Bates, Tully, Watterson, Jefferson-town and Wheeler. A middle school program, called In the Middle of Engineering, is offered at five schools -- Carrithers, Ramsey, Newburg, Olmsted Academy North and Olmsted Academy South.