For more information on workshops or to register, please contact

Kim McCoy
Assistant Director
CityLab and Watershed Coordinator
508.531.2630
kmccoy@bridgew.edu

Maura Whittemore
Administrative Assistant
508.531.2575
mwhittemore@bridgew.edu
CityLab

Half-day Sessions ($50 each)
The following sessions will be offered from 4:00 - 8:00 PM on the dates indicated.

- Pipetting 101 and Crucial Concentration (03/18/15)
- Mystery of the Crooked Cell (04/01/15)
- Lab Larceny (04/29/15)

Full Day Sessions ($125)
Full-day sessions, covering all of the following topics, will be offered on April 23, 2015 from 8:30 AM - 4:00 PM.

- Pipetting 101
- Crucial Concentration
- Mystery of the Crooked Cell
- Lab Larceny

- Participants in half-day sessions will be able to earn up to 10 professional development hours; full-day participants will be able to earn up to 20 professional development hours. Registration is limited and dates are subject to change.

- Teachers who attend CityLab Professional Development Workshops may borrow equipment to reproduce the modules at their own schools, or bring students to Bridgewater State University to participate in modules led by CityLab staff.

Biomimicry is the process of emulating nature’s strategies - which have been evolving for 3.8 billion years - to solve complex human problems. Biomimicry is relevant to all STEM fields, and has given rise to new design and technology, including:

- Climbing robots, boots, and tape that mimic gecko feet and their adhesion abilities;
- Improved aerodynamic modes of transportation inspired by birds;
- Energy generating devices inspired by schooling fish;
- Temperature control without power inspired by properties of termite mounds;
- Better solar power collection by mimicking the arrangement of leaves on a plant;
- Aircraft wings and flight techniques inspired by birds, bees, and bats; and
- Germ-free services that re-create properties of shark skin.
The 2015 CASE Conference, *Teaching STEM with Biomimicry*, provides K-12 teachers with the opportunity to enhance science and math teaching and learning by engaging students with nature's lessons.

Teachers will leave the conference with sample projects, activities and/or lessons they can include in their teaching.

**Pipetting 101**
This module introduces students to micropipettes and assays. These techniques, and precision instruments have become the standard in most biotechnology and medical laboratories, but they remain beyond the budget for many school science laboratories. Pre-lab activities are included and recommended for students who would benefit from review in metric measuring and math concepts.

**Suitable for both middle and high school students.**

**Crucial Concentration**
This module introduces students to the use of micropipettes for measuring small volumes of liquid. Students perform colorimetric assays with spectrophotometers to determine the actual amount of protein in drinks. Math skills are involved in analyzing the data, including graphing and determining linear relationships between variables.

**Most suitable for middle school students.**

**Mystery of the Crooked Cell**
This module allows students to explore the molecular basis of sickle cell anemia. Acting as medical technologists, students are asked to determine what might be causing a collection of symptoms in an imaginary patient. Students will develop their micro pipetting skills, and use protein gel electrophoresis as a diagnostic tool to differentiate sickle cell hemoglobin from normal hemoglobin. Pre-lab and post-lab activities help students explore the nature of this hereditary disease.

**Most suitable for middle school students.**

**Lab Larceny**
This module allows students to perform DNA fingerprinting on samples isolated from “blood” found on site at the Forensics Institute of Bridgewater. Students will use techniques that are based on restriction fragment length polymorphism (RFLP), and involve agarose gel electrophoresis to resolve the DNA fingerprints. This activity also introduces students to micropipettes.

**Most suitable for high school students.**
Watershed Access Lab

Project WET

Project WET is a hands-on workshop that focuses on global water issues. *Project WET Curriculum and Activity Guide 2.0*, released in Sept. 15, 2011, addresses both the most pressing contemporary water issues—such as water-related disasters, water foot-printing and water conservation—and classic water science topics like watersheds, and the chemistry of water. Guide 2.0 offers fun, interactive, science-based activities for students K - 12 and is correlated with national standards including NAAEE as well as National Science Education Standards. Workshop participants will receive a copy of the guide along with access to the Discoverwater.org, an interactive web experience that teaches the various roles water plays. In Massachusetts, Project WET is sponsored by Bridgewater State University.

Project WILD & Project Aquatic WILD

Join us for this fun, hands-on workshop that focuses on both the Project WILD and Project Aquatic WILD activity guides. Project WILD/Aquatic WILD are interdisciplinary, conservation, and environmental education programs that emphasize wildlife, aquatic wildlife, aquatic ecosystems, people, and the environment. The program guides contain over 140 activities for educators of youths in grades K-12 that are correlated to the NAAEE guidelines as well National Science Education Standards. Workshop participants will receive copies of each guide, access to the lending materials, and a certificate of completion. In Massachusetts, WILD and Aquatic WILD are sponsored by MassWildlife.

Round and Round We Go!

Spatial skills have been shown to be a strong predictor of success in STEM fields and opportunities to develop spatial skills may even draw more students into these fields (Uttal, et al, 2013). Rotation is one of the transformations that students must have opportunities to practice in preK through grade 12. This workshop will look at mathematical games and puzzles which push students’ limits in rotating objects in the world around them.

Date of Event: March 30, 2015
Time: 4:00 - 5:30 PM

What Are the Odds?

Probabilistic reasoning is all around us, but our probabilistic intuition and that of our students’, is often weak. For better or for worse, we make many decisions based on probability. This workshop will look at mathematical games and puzzles which are engaging and fun, but require the extensive use of probability to win.

Date of Event: May 5, 2015
Time: 4:00 - 5:30 PM

All games are easy to learn; many have language free entry, and can be easily differentiated for learners’ age and current performance.

All workshops are open to preK—12 educators. Fee is $15 per workshop.
Patterns All Around!

Patterns are all around us, but it’s not always easy to identify and formulate them. Some patterns are visual, others are numerical, and others still are made up of sounds. Identifying patterns helps children learn to generalize what they are doing and learning in mathematics in grades preK-12. Identifying patterns is a major component of the Standards for Mathematical Practice #7 (Look for and make use of structure) and #8 (Look for and express regularity in repeated reasoning). This workshop will look at mathematical games which give students an opportunity to find different types of patterns in a non-stressful environment.

Date of Event: Workshop has already occurred.

Strategy and Problem Solving!

Our students will be lost in the world if they are unable to strategize and solve novel problems. In mathematics, their ability to do so is even more essential. In fact, “Make sense of problems and persevere in solving them” is the first and central Standard for Mathematical Practice. This workshop will look at mathematical games and puzzles which engage students in looking a few steps ahead, developing strategy, and solving novel problems.

Date of Event: March 25, 2015

Time: 4:00 - 5:30 PM

WOW! Wonders of Wetlands

WOW! Wonders of Wetlands is a hands-on workshop that focuses on wetlands. We will explore the characteristics, functions, and the value of wetlands. Each topic will be illustrated with activities that educators can use with their classes. Each participant will receive a copy of WOW! The Wonders of Wetlands, a nationally acclaimed educators’ guide to wetland education. The WOW! educator’s curriculum guide includes over 50 hands-on activities for grades K-12 that are correlated to the National Science Education Standards. Workshop participants will receive a copy of the guide, access to the lending materials, and a certificate of completion. WOW is sponsored by Environmental Concern.
Growing Up WILD

Growing Up WILD is a hands-on workshop that focuses on environmental education in early childhood. The activity guide builds on a child’s sense of wonder about nature, and invites them to explore wildlife and the world around them. Through a wide range of activities and experiences, it provides a foundation for developing positive impressions about nature while also building lifelong social and cognitive skills. GUW is correlated to the National Association for the Education of Young Children (NAEYC) Standards and the Head Start Domains. Workshop participants will receive a copy of the guide, access to the lending materials, and a certificate of completion. In Massachusetts, Growing Up WILD is sponsored by MassWildlife.

Environmental Experience for Early Childhood (PLT)

Join us for this creative, hands-on workshop that focuses on engaging children in outdoor play and exploration through developmentally appropriate activities. It is specifically designed for educators working with preK aged students. The topics include exploring nature with all senses, forests through the seasons, and tree habitats. There is also an accompanying music CD that encourages children to sing, dance and get moving. The guide is correlated to national standards for preschool education by NAEYC, Head Start Domains, and NAAEE. Workshop participants will receive a copy of the guide, access to the lending materials, and a certificate of completion. In Massachusetts, PLT is sponsored by Massachusetts Department of Conservation and Recreation.

Certificates of completion (6 hours) will be provided for each workshop that is attended and can be applied toward Professional Development Points.