

Chemistry of stream water for 6th Grade students

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At age twelve, students have a natural curiosity about their environment. By fostering collaboration with Rivers School, students participated in collecting stream samples on most school days after minimal instruction. They recorded date, water temperature, and specific conductivity for each sample, completing the process in about ten minutes at a stream flowing through their campus, using an inexpensive handheld conductivity tester. They were then able to observe as water chemistry was measured by inductively coupled optical emission spectroscopy at Wellesley College, giving them a first-hand experience of a modern chemical laboratory. After analysis was completed, results were brought back to their school for students to look for trends in the data they collected in a class period.

Specific conductivity in microsiemens/cm are known to show a linear trend with sodium content of the water in mg/L, with slope of 0.152 empirically derived from 32 previously analyzed samples within the same and similar stream basins in Eastern Massachusetts. Using Na, Cl, and Mg analyses, an increase in salt comes during a period with the first snowstorm and application of road salt upstream, while Mg remains constant, then all three elements decrease with dilution by a 3cm rainstorm.

These students were chosen to present these results to the entire school (through grade 12) as a result of this project. Integration of chemistry and geoscience gave them the experience of producing a significant scientific result