WEST (Water, the Environment, Science, & Teaching): Implementing Inquiry-based Learning in K-12 Classrooms

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WEST (Water, the Environment, Science, and Teaching) is a National Science Foundation GK-12 fellowship program at the University of Utah. Nine graduate student fellows from the departments of Geology and Geophysics, Meteorology, and Biology used inquiry-based methods to teach basic science concepts to K-12 students in the Salt Lake City School District. Fellows worked with teachers to develop lesson plans, teaching modules, and field trips centered on the water and environment theme. Lessons were designed to address key environmental concepts while maintaining Utah state core curriculum requirements for science teaching in grades K-12. Some lessons involved long-term experiments that built upon previously learned material while reenacting basic science concepts. For example, one fellow developed a series of experiments to test the chemistry of the nearby Jordan River. The Jordan River flows from north to south through the core of an industrial region and into Great Salt Lake. Students collected samples of the river water on a weekly basis and tested it for changes in temperature, pH, total dissolved solids, nitrate, and dissolved oxygen. These experiments were designed to impart an understanding of the Jordan River as a dynamic urban ecosystem. The results served as the basis for lessons on water chemistry, erosion, pollution, and sediment transport and resulted in several student science fair projects. Other lesson topics included the greenhouse effect, climate change, human impacts on water resources, animal foraging behavior, clouds and weather, wetland ecosystems, shorelines as indicators of environmental change, and regional geologic history. Fellows and teachers also co-led field trips that integrated ecology, geology, and meteorology to teach students about their natural surroundings. The goal of WEST is to develop a sense of wonder and passion about nature in K-12 students that will encourage them to pursue careers in the STEM (Science, Technology, Engineering, and Math) disciplines.