

Getting the Message Out: Technology Equipment for Chemistry and Biology Classrooms

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As the methods for exploring scientific phenomena become more sophisticated and instrument dependent, high school students' perception of scientific research becomes progressively more naive. How, then, do you teach laboratory techniques dependent upon instrumental analysis to students when neither instruments nor appropriate experiments are available in high school laboratories? The Purdue University School of Science is actively attempting to find a solution.

The Purdue Instrument Van Project is a curriculum development collaboration of Indiana high school chemistry and biology teachers and the university, currently funded by the National Science Foundation. In five weeks of workshop over two summers, teachers are developing experiments utilizing instrumentation. These experiments are designed to relate to issues that are of interest to high school students, to reinforce chemistry and biology concepts, and to acquaint students with instrumental techniques of analysis. Curriculum modules are written for the classroom which give students an opportunity (1) to explore concepts by demystifying the instruments through simple demonstrations and activities; (2) to develop further understanding of theory through techniques such as guided readings, group discussion, and computer-assisted instruction; and (3) to apply this understanding to actual experiments which use the instruments.

Following the summer workshops, the Purdue Chemobile delivers to the high school classroom sets of smaller instruments such as nuclear scalars, pH meters, Spectronic 20's, microfuges, and electrophoresis apparatus. Larger instruments such as infrared spectrophotometers, scanning ultraviolet-visible spectrophotometers, gas chromatographs, high performance liquid chromatographs, and an atomic force microscope are permanently mounted on rolling carts which also go into the school laboratory. Essentially, the Chemobile is a lending library of instruments available to any teacher participating in the project. Participating teachers represent all schools: rural, urban, suburban, private and parochial.