YALE NATIONAL INITIATIVE
to strengthen teaching in public schools®

Curriculum Units by Fellows of the National Initiative
2009 Volume V: Green Chemistry

"How Much Is Too Much"? Teaching Measurement and Solution Concentration through Bioaccumulation and Levels of Toxicity

Guide for Curriculum Unit 09.05.01, published September 2009
by Myrna M. Alvarez

We use multitudes of harmful chemicals that pollute the air, the lands, and the waters. Pesticides are one of them. These pesticides have numerous wonderful uses; but they also have damaging effects. They contain hazardous agents that have the ability to leave behind residues that linger, and become more potent as they magnify and extend beyond limits of contamination.

My curriculum unit focuses on the harmful and bioaccumulative effects of heavy metals in pesticides. I developed lessons and hands-on activities that built a strong link between photosynthesis and bioaccumulation. The culminating project is a power point presentation that will be evaluated based on how well my students have studied and analyzed EPA-released cases of bioaccumulation from Chicago and some parts of the Midwest. I believe, using these teaching tools of social significance, I can ease the teaching of measurement, and going further, the concept of solution concentration.

The lab activities and lessons address the goals of the Illinois State Standards. They are designed to develop scientific inquiry, and enrich their knowledge and skills on life, physical, and technological aspects of science as a core high school course.

My curriculum unit is intended for honors level biology and chemistry classes.

(Developed for Honors Biology, grade 9, and Honors Chemistry, grade 10; recommended for Honors Biology, grade 9, and Honors Chemistry, grade 10)