Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
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The aim of this seminar is to introduce mainly the technological, but also the policy and societal issues of environmental problems into the K-12 curriculum. It will be critical for the world citizen to be well informed on the important aspects of the methods used to address environmental issues. This awareness requires that our young students understand the technology used to assess environmental problems including the limitations of the measurement techniques and the inherent errors associated with the techniques. At the same time, discussion of environmental problems—whether they be the greenhouse effect, radon or lead pollution, or the ozone hole—can be a very effective method of introducing the scientific method to the K- 12 students. In addition, the basis for deciding the pollutant thresholds for harmful effects to humans is non-trivial and requires introduction (depending on the level of the student) of the statistical analysis of environmental and health data. Even a fourth grader can appreciate that if the fish in tanks containing water at different pHs behave quite differently, e.g. feeding habits, lethargy etc., then the variable pH is an important one to assess ecological damage. Nonetheless, the fact that, in many instances, important societal decisions are made without fully understanding all the scientific data or on the basis of political pressures, should also be an important aspect to discuss with the students and should be used to foment debate among the students.

The best way to teach science to the curious mind of the school-age child is by employing active “hands-on” techniques. The various units in this seminar provide numerous examples of “hands-on” approaches to environmental science. In fact, environmental science is a “natural” for the use of hands-on techniques because many of the topics, e.g. dust in the air, availability of water, sewage, abundance of wildlife, etc., can be studied by activities that kids can readily relate to. In addition, the constant infusion of ecological/environmental articles in newspapers and magazines enable the teacher to relate the scientific topics being explored in the classroom (and in the school yard, the local pond or at home) to topics that claim the attention of politicians, civic leaders, and the general public. With these attributes, the use of the environmental science units in the school can lead to an exciting way to teach science.

The range of topics in the units covers a wide span from the greenhouse effect and deforestation, to acid rain, radon and lead pollution, the ozone hole, recycling, oil spills, and the ecology of local streams and ponds. Throughout the various units, emphasis is placed on several simultaneous goals: 1) to introduce both the jargon and the units used to discuss the relevant environmental science problems, 2) to outline the level of knowledge currently available and the important questions that remain for each of the key areas, 3) to introduce ways of measuring and monitoring the important quantities that cause environmental concern, and 4) to relate the classroom activities to their school, their home and their community.

Antonio Lasaga