



Curriculum Units by Fellows of the National Initiative
2010 Volume V: Nanotechnology and Human Health

Nanotechnology and Clean Water: How Safe Is Our Drinking Water?

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This is an inquiry-based unit designed to guide students in the development of pertinent questions about direct (*i.e. personal*) concerns of water quality, as well as indirect (*i.e. global*) concerns about water quality.

After energy, the second major problem facing global society is the availability of clean water. To address this concern, intelligently and cooperatively, members of society must be well informed. Presenting students with a conceptual framework to help them understand size and scale, the basic functions of atoms and molecules, and some emerging applications of nanotechnology will provide them with essential knowledge.

Access to clean water is a bigger problem for exploited and under industrialized areas than hunger. Within the next two decades, the average supply of water per person will drop by one third, possibly condemning millions of people to severe dehydration and avoidable premature death. The design and manipulation of atomic and molecular scale (*nanoscale*) materials offers great possibilities for advances in cleaner energy production and water treatment.

One of the primary reasons for teaching this unit is to foster a basic understanding of nanotechnology and its applications in the field of chemistry, as it relates to water pollution and purification. I contend it is essential to facilitate a learning experience that empowers students to analyze the relative quality of drinking water in their community.

The crux of my unit is to integrate the performing arts (*i.e. drumming, dance, and drama*) into science, an approach I refer to as 3D Aesthetic Science Education (*ASE*). This approach to science education through the arts is designed to expand the students' understanding of scientific concepts and principles through interpretive performance based activities.

(Developed for Chemistry/Atomic Structure, grades 10-11, and AP Environmental Science, grades 11-12; recommended for Chemistry/Water Chemistry/Pollution, grades 10-11, Environmental Science, grades 9-10, and AP Environmental Science, grades 11-12)

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