

Preparing for the Real Enemy

Failure to understand science is a national-security issue—and not for the reasons you think.

By Charles W. Anderson

Listening to politicians in both parties pander to the electorate, it's easy to think that the overarching national energy goal can be neatly summarized in two words: cheap gas. And identifying the biggest threat to national security can be done even more succinctly: terrorism.

But such one-dimensional rhetoric isn't just the fault of politicians, who often are merely responding to constituents' unrealistic expectations.

A hint of the politicians' dilemma was buried in a May 10 *New York Times*-CBS News poll about the performance of U.S. elected officials on a host of policy issues.

Not surprisingly, neither President Bush nor Congress earned high marks. What startled me, though, was the response to this question: "Regardless of how you usually vote, do you think the Republican Party or the Democratic Party is more likely to see to it that gasoline prices are low?"

Fifty-seven percent of the respondents said that the Democrats could keep prices low. Another 14 percent chose the Republicans or both parties. Seventy-one percent of Americans, in other words, see the price of gas as a political issue. This is tantamount to living in a fantasy world and ignoring both the economic law of supply and demand and the accumulating environmental damage caused by our fossil-fuel-dependent economy.

It's not surprising that many politicians choose to respond to numbers like these with stopgap measures that delay the inevitable reckoning, hoping that something will come



— Nip Rogers

up in the meantime. But the root of the problem stretches beyond Washington to an electorate that can't evaluate science-based statements. It's time, then, for a sea change in science education in our nation's schools.

Imagine how politicians would act differently if the public were more knowledgeable about ideas currently considered too arcane for political debate—fossil-fuel supply chains; hidden costs not included in the price we pay for a product; and the chemistry of tailpipe emissions.

That scenario remains imaginary for now, since, by every indication, the public is ill-equipped to evaluate arguments based on such ideas. Adults and children know that pollution is bad for the environment and that trees are good, but they have no idea why experts see the price of gasoline as connected to housing policies, ethanol production, or plug-in hybrids.

Blithe ignorance almost would be funny if the stakes weren't so high.

Global climate change and environmental degradation pose a greater risk to us all than do terrorists or military and economic competition. Yet these affronts to the natural world attack in ways that make it tough to see the primary cause of obviously destructive effects—a spike in the price of gasoline, forests destroyed by drought, floods of refugees in failed nation-states unable to feed their people, and so on.

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Our schools are essential in helping to shine light on these causal chains. In fact, enhancing national and global security requires preparing students to be environmentally responsible citizens.

As consumers, our students will one day decide what kinds of cars to buy and where to live. As voters, they will decide which politicians to elect and what issues are important. As workers, they will enact the environmental practices of small companies and large corporations. As volunteers and advocates, they will decide which issues we are prepared to deal with at the grassroots level.

Unfortunately, though, the current science curriculum is not up to preparing our students to be environmentally responsible, period.

Too often, our students learn science in contexts that are connected neither to current political issues nor to students' future societal roles. The curriculum is fragmented into tiny pieces that render the important connections invisible. And worst of all, the focus on testing and accountability has placed memorization of facts ahead of preparing students to understand the nature of science and evaluate the validity and accuracy of scientific arguments.

Public understanding of science means more than preparing students to take exams that are quickly forgotten once the scores are in. To give Earth its proper place in our political and economic debates, both citizens and leaders will have to understand some practical truths about chemistry, earth science, and biology—in addition to politics and economics, the usual proving grounds of today’s leaders.

Responsibility for such training rests with our schools, which still provide a common set of core knowledge and skills to our widest swath of society. The nature of that core knowledge is important. Specifically, for our schools to graduate students who are capable of being environmentally responsible citizens, we should change our K-12 science curriculum in two fundamental ways: by incorporating recent advances in environmental science, and by making science a communal resource for political and economic arguments.

As in much of science, barriers are coming down between traditionally separate environmental disciplines. Modern ecology, for example, now focuses on the close relationship between human and natural systems. Ecologists work with atmospheric scientists, earth scientists, and social scientists to study how human populations alter natural ecosystems. For years, university researchers routinely have built and refined computer models to explain what resources human beings extract from natural systems and what wastes we put back in. Now it’s time for a K-12 curriculum that includes this new and more-integrative approach to science.

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We cannot anticipate which environmental issues will loom largest for our children during their lifetimes or how such issues should be addressed. So it doesn’t make sense to conceive of science education as a platform for advocating particular policies. But in an increasingly complex world, basic scientific knowledge should be a communal resource that all citizens can draw on. And for the rudimentary toolkit of scientific reasoning to be available to and respected by all citizens, science training needs to be emphasized from the earliest primary grades.

Citizens who can use the implements of science—rational inquiry, evidence-based arguments, and the like—still may disagree on moral, political, and economic grounds. But they also will be able to understand and evaluate the arguments that exist among experts, and, subsequently, to make better decisions about policy and government action. We must create a science curriculum that supports students’ use of these tools.

With such difficult issues and sharp political divisions, it’s perhaps unreasonable to think that a new ethic of shared scientific knowledge will, on its own, foster public consensus. But such an ethic may improve the chances that our politicians will engage in informed debate—and that the political process will produce reasonable decisions.

Besides, what's the alternative? What happens if the public cannot understand even the most basic arguments among experts?

One certain outcome of staying the present course is that politicians will continue to get elected by pandering to short-term, pocketbook interests. Another, unfortunately, is that Earth will continue to change in terrifying defiance of our uneducated popular opinion.

Charles W. "Andy" Anderson is a professor of science education at Michigan State University, in East Lansing, Mich. He can be contacted at andya@msu.edu. Kristin Gunckel, a graduate student at the university, and Beth Covitt, a postdoctoral researcher, contributed to the research and writing of this essay.

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