

A memorandum from the chair of the board highlighted "a national action plan for addressing the critical needs of the U.S. science, technology, engineering, and math education system." The action plan stated, among other things, that vertical integration was a key component for STEM learning. For me, that not only meant an integrated approach to K-12 and higher STEM education but also the integration of important historical knowledge, modern developments, and today's hot topics. I attempted to summarize the essentials in a tome smaller than the usual, ponderous textbooks that have frustrated students in the past. After several years, I finished *Working Knowledge: STEM Essentials for the 21st Century* (Springer, 2012). Key to the book's quantitative teaching and reasonable size (340 pages) is the use of mathematics, including apps from the developers of Mathematica. The book also provides references to additional online resources.

In my opinion, we simply need to provide more concise, focused, and engaging textbooks and internet tutorials. STEM texts need to treat the broad field as a whole and not as a collection of different subjects. Teachers need to individualize that knowledge for students

and connect it to such important topics as global warming, renewable energy, the understanding of DNA, and the marvelous tools of our information age. Not building radios in schools is a small price to pay to accomplish that.

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For some questions, science may not have answers

The letter by Calvin Kalman in the August 2013 issue of *PHYSICS TODAY* (page 10) attributes to the Jewish philosopher Moses Maimonides the idea that, as Kalman says, "it is important to be a scientist and to find scientific reasons for everything in the world."

The word "everything" is somewhat ambiguous. Is Kalman claiming, by quoting Maimonides, that all that exists is the subject matter of science? That if we have no scientific reason or evidence for something, then that something cannot exist?

Surely, not only the question of the origin of life, which Keith Schofield

raised in his letter (*PHYSICS TODAY*, August 2012, page 12), but questions of consciousness and of free will may be beyond the bounds of science. For instance, what measuring devices, other than human beings themselves, can we use to detect human consciousness? Clearly, purely physical data cannot penetrate the mystery that is the human mind.

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