

DIRECTOR'S NOTES

Tools of Our Trade

We declared in 1989 (correctly I think) that “*Science for All Americans* has little to say about what ails the educational system, points no finger of blame, prescribes no specific remedies.” Nor has Project 2061 gone on to develop curricula, train teachers, set policies, or otherwise have a direct hand in effecting the changes needed to bring about actual reform. What, then, *does* the project do? Perhaps the best short answer is this: It creates tools to be used by others in their efforts to reform K-12 science, mathematics, and technology education.

Take the case of *Benchmarks for Science Literacy*, for instance. It is *not* a curriculum or a plan for a curriculum; it *is* an instrument for guiding curriculum analysis and reform. Although it is not a set of standards, it has served as the main source in drafting the national science education standards and many state frameworks. It is not a textbook, yet it is being used in many teacher education programs to help future teachers understand the nature and application of specific learning goals. It is not a research report, but developers of instructional materials find it enables them to take research findings conveniently into account when making content placement decisions. And although *Benchmarks* is not a test instrument, it is being used for both test analysis and test development.

GETTING THE JOB DONE

An interesting thing about tools is that they often turn out to have all sorts of uses that were not foreseen at the time of their creation. Our growth-of-understanding maps offer a case in point. Strand maps, as they were originally called, were conceived as tools for deciding on the expression and grade-level placement of individual benchmarks or learning goals. Somehow, they had to incorporate both the logical deconstruction of major concepts from *Science for All Americans* and what was known about how and when students gain their understanding of those concepts. Nothing “off the shelf” would do the job; an entirely new tool was required. In the end, the

teachers and others who helped to develop *Benchmarks* found the maps to be essential aids to their work.

Since then, many other uses for the growth-of-understanding maps have been found. For example, they are used in both professional development programs and in undergraduate courses to help teachers improve their understanding of science, mathematics, and technology concepts. They are used in school districts to guide efforts to increase curriculum coherence from grade to grade. Some publishers find their portrayal of curriculum connections across grades and disciplines particularly valuable as they develop new instructional materials. And to its surprise, Project 2061 has discovered that the maps (especially those created since the publication of *Benchmarks*) can be turned back on *Benchmarks* itself to show where an interim learning goal is needed or where new links between goals might be made. Indeed, with so many new uses for maps being discovered, Project 2061 has decided to make them available in a new tool—the *Atlas of Science Literacy*.

All in all, I think it makes good sense for Project 2061 to continue developing the tools of our trade and helping educators to use them well. And at every stage of the toolmaking process, we will continue to work closely with our reform-minded and results-insistent colleagues in the schools. They not only help us to create the tools, they also invent new and powerful ways to use them. As we said in *Benchmarks*, “significant, lasting reform in education will happen only when people charged with operating the schools become part of the creative process.”



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Director

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