



THE LAWRENCE
HALL OF SCIENCE
UNIVERSITY OF CALIFORNIA, BERKELEY

Why Schools Need Professionally-Designed Instructional Materials

In the Next Generation Science Standards era, K–12 classroom teachers need carefully-developed, research-based, rigorously tested instructional materials more than ever.

Next Generation Science Standards (NGSS) call for sophisticated and nuanced approaches to teaching that reflect the most current information about how people develop complex understandings about science and engineering over time. NGSS requires that students regularly engage in “three-dimensional” learning experiences that allow them to understand Disciplinary Core Ideas by engaging in a Science or Engineering Practice, and then to deepen their understanding by exploring that Core Idea through the lens of a Crosscutting Concept. Learning experiences need to be three-dimensional and also support and align with specific Common Core Mathematics concepts and build on specific Common Core English Language Arts capacities. With enough time and the right types of support, designing and developing a learning experience that meets these criteria can be a daunting but instructive task for classroom teachers that promotes reflection and professional learning. It is, however, unreasonable to expect working teachers to design and develop units of study, much less a curriculum or course that meets these criteria. The learning experiences that teachers develop in the context of professional learning are often usable and helpful to the individual teacher/developers, but are often not generalizable for a broad community of teachers to use.

Teachers are expert users of instructional materials, but developing them requires different expertise. Professional musicians are not asked to demonstrate their expertise by designing and fabricating their instruments. Not every member of a band or orchestra needs to write original music. Baseball players, even in the Major Leagues, are not expected to lathe their own bats or sew their own gloves. Doctors are not routinely asked to form committees to develop their own surgical procedures. Just like other professionals, teachers can and should be expert users of the highest quality instructional materials available. Better, more experienced teachers can use the materials they have at a higher, more sophisticated level, but do not need to build their materials from scratch any more than concert pianists need to build their pianos.

Literally thousands of hours go into creating the Hall’s instructional materials.

Lawrence Hall of Science instructional materials are developed according to exacting design criteria by large teams. A single instructional unit might be shaped by a collaborative team comprised of a classroom teacher, a science curriculum developer, a scientist, a literacy specialist, an assessment specialist, a learning scientist, a digital designer, an editor and a videographer. The development of the unit typically takes many months of full time work, then is systematically tested and critiqued by dozens of classroom teachers around the country, and then revised and tested again. By the time the unit is published and widely available, an effectiveness study may have already been conducted demonstrating student gains that result from engaging in the unit. We would not expect teachers, working individually or on a school or district committee, to be able to do this any more than we would expect them to build their classrooms. Lawrence Hall of Science is not only a developer of instructional materials: the Hall also designs comprehensive systems to support districts, schools, and teachers to implement our materials. The Hall helps school systems improve their capacity to advance their science programs, support high-quality science instruction, and design and facilitate professional learning for school system leaders and for teacher leaders. In addition, the Hall helps schools to establish materials management systems and provides ongoing technical assistance to the users of our materials.

Like other professionals, teachers need and deserve the best tools available in order to reach their full potential. When school systems provide teachers with high-quality instructional materials, they can be assured that all students in all classrooms in all schools have equitable access to the same learning experiences. Instructional materials can level the playing field so that students in classrooms with less experienced teachers have the same opportunity to learn as students in classrooms with more experienced teachers.