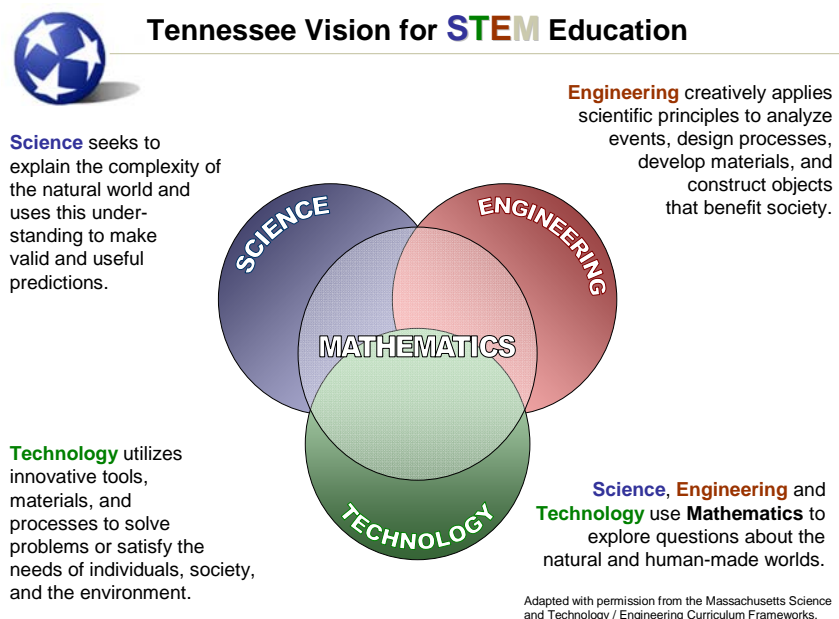


Tennessee's Vision of Standards-Based Science, Technology, Engineering and Mathematics Education

The [Tennessee Mathematics Curriculum Framework](#) presents an educational pathway designed to prepare every student to function in a society in which mathematical, scientific and technological literacy are necessary for full participation and enjoyment. The new standards are founded on the premise that leaning mathematics content is most successful when experienced through an active process that integrates inquiry, technology and engineering, and science, in what is commonly referred to as STEM Education (figure 4).

Figure 4. Tennessee Vision for STEM Education



The goal of standards revision is to develop a curriculum framework that will guide and support school systems in building a rigorous and relevant K-12 mathematics curriculum. The educational vision reflected in the *Framework* is that a carefully designed, coherent, and properly implemented set of K-12 mathematics learning experiences will enable all students to:

- Develop a deep understanding of the key mathematical concepts, principles, and theories drawn from contextual applications
- Apply process skills by posing questions and investigating phenomena through the language, procedures, and tools of mathematics
- Be aware of how engineering, technology, and science are integrated into the historical and cultural advancement of mathematics
- Think and act in a way that demonstrates a positive attitude toward problem-solving and personal decision-making about issues that affect society

Further, all Tennessee students should emerge from their K-12 mathematics education experiences fully prepared for transitioning to higher education, careers in the technical workforce, and service to their communities or nation.

Implementation of the new Mathematics Standards

The new standards and course and grade level expectations can and should be used by all stakeholders in the mathematics education arena to guide whatever decisions are deemed necessary to support effective K-12 mathematics programs. Because the Curriculum Framework is based on a developmental progression, teachers will introduce mathematics content and skills at a level of sophistication consistent with a student's readiness to learn and discover. Similarly, different emphases will characterize instructional time allocations at individual grade levels.

Figure 5 illustrates a *suggested* percentage of emphasis for the teaching of the content and integration of the embedded strands for number, algebra, geometry, measurement, and data analysis and probability. The Standards' orientation toward the teaching of mathematics in the lower grades and its shifting emphasis in grades 9-12 is consistent with the research on when students learn best.

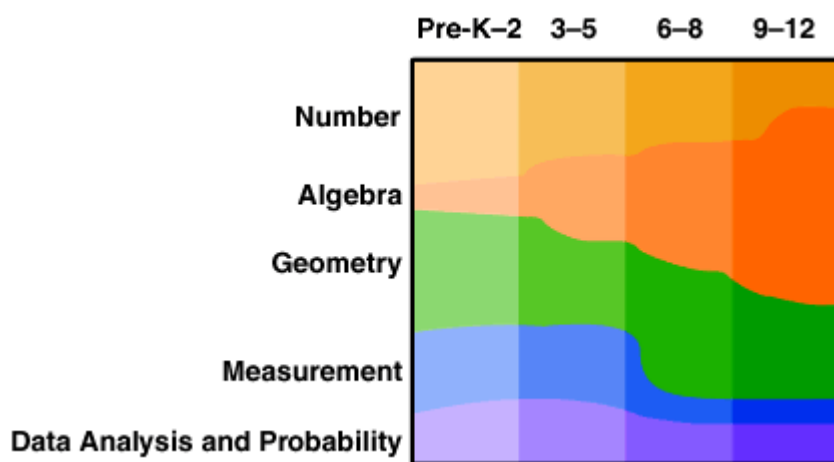


Figure 5. Suggested Emphasis by NCTM for Content Standards across the grade band.

Next Generation Tools for STEM Education

A Resource for Implementing the Tennessee Science and Mathematics Curriculum Frameworks

The materials found in the *Next Generation Tools for STEM Education* constitute a "toolkit" that can be used to support teachers who are moving toward standards-based practices. Within the contents, the term "standards-based" describes educational contexts wherein everything that is associated with teaching and learning is referenced to the national and state standards. The tools found on the disc can assist with the implementation of the mathematics curriculum standards (SBE 2001). All of these standards-based tools have been customized to align with the Tennessee Science and Mathematics Curriculum Standards.

The *Next Generation Tools for STEM Education resource* was developed after recognizing that teachers need quality support materials and clear, high quality work samples for implementing the state curriculum standards. To be successful, every teacher must have appropriate instructional tools and the background preparation needed to implement curriculum standards in the classroom. Some materials, like grade and attendance managers, simplify routine classroom management tasks. However, labor-saving technologies for delivering standards-based curriculum and instruction and for preparing aligned assessments are not routinely available to teachers. Without proper tools, effective implementation of many standards-based reform practices, while possible, are not really feasible for most teachers. The compilation of standards, curriculum development and instructional tools, science and mathematics teacher resources, and work samples found in the *Next Generation Tools for STEM Education* can facilitate the consistent delivery of high-quality, standards based instruction.