

What Constitutes a STEM Program of Study?

A Guide for Florida's Public Schools

The acronym STEM is fairly specific in nature referring to science, technology, engineering and mathematics; however, the concept of STEM encompasses much more than the sum of its parts. Workers in STEM occupations use science and math to solve problems and drive our nation's innovation and competitiveness by generating new ideas, new companies and new industries.¹ STEM programs of study are typically classified based upon four occupational clusters: computer technology; mathematical sciences; engineering and surveying; and natural, physical and life sciences. STEM programs in Florida's Public Schools must embrace the integration of technology and engineering in science and mathematics. In addition, Florida's Public School STEM Programs include the following features:

- A curriculum driven by problem-solving, discovery and exploratory learning that requires students to actively engage a situation in order to find its solution.
- Nature of technology; engineering design; and systems thinking, maintenance and troubleshooting incorporated into the science and mathematics curricula.
- Innovative instruction allows students to explore greater depths of all of the subjects by utilizing the skills learned.²
- Technology provides creative and innovative ways to solve problems and apply what has been learned.
- Independent and collaborative research projects embedded in the curricula.
- Collaboration, communication, and critical thinking skills threaded throughout the curricula.
- Opportunities for mentoring by business, industry, and research organization leaders.

Access to STEM programs should not be limited. Programs should strive to increase the number of students enrolled, with emphasis on students from under represented subpopulations as well as those who may be struggling. Even those students who struggle in math and science during school can succeed on the job; with perseverance, many people who may have had difficulty with early math or science classes can later thrive in a STEM career.³

Although STEM programs are not limited to Career and Technical Education (CTE) programs, Florida's Public Schools offer a variety of CTE programs that lead to industry certification in STEM related fields. For a more comprehensive list of these programs, visit the CTE website at http://www.fldoe.org/workforce/dwdframe/stem_cluster_frame11.asp.

¹ STEM: Good Jobs Now and for the Future by David Langdon, George McKittrick, David Beede, Beethika Khan, and Mark Doms, U.S. Department of Commerce Economics and Statistics Administration, July 2011 (http://www.esa.doc.gov/sites/default/files/reports/documents/stemfinaljuly14_1.pdf)

² Understanding the Basics of STEM Education by Dr. Patricia Fioriello, November 2, 2010 (<http://drpfconsults.com/understanding-the-basics-of-stem-education/>)

³ STEM Occupations by Nicholas Terrell, *Occupational Outlook Quarterly*, Spring 2007 (<http://www.bls.gov/opub/oog/2007/spring/art04.pdf>)