

## WHY STEM?

Ultimately, there are two sectors propelling the momentum in STEM: education and the economy. More STEM professionals are needed to meet employer demand in STEM-related fields and STEM instruction overall must be improved to meet the rising skill demands of the labor market.

### STEM ECONOMY

The primary driver of our nation's future economy and simultaneous creation of jobs will be innovation, largely derived from advances in science, engineering, and technology production. As a career cluster, STEM occupations represent 5% of total occupations in the U.S., but they generate the technological and scientific changes that shape all other occupations, amplifying the demand for STEM skills. The net result of this impact is that ***20 percent of all U.S. jobs (26 million) now require a high level of knowledge in at least one STEM field.***<sup>i</sup> These jobs are found across all industries, not just traditionally defined STEM industries.

There are ***two STEM economies*** to support. One that is a professional STEM economy that plays a vital function in keeping American business on the cutting edge through continuous innovation, research, and global leadership. These occupations, requiring a bachelor's degree or more, and make up 51% of all jobs requiring deep knowledge in STEM. The second STEM economy is driven by the first, and benefits from the multiplier effect of the professional STEM economy. The employees in these occupations are critical to the implementation of new ideas, and advise on the feasibility of design options and other practical aspects of development. This STEM economy depends heavily on graduates of technical and community colleges and makes up 36% of jobs requiring deep STEM knowledge.<sup>ii</sup>

### STEM EDUCATION

Both STEM economies need a rich supply of STEM-skilled individuals to lead, research, design, and implement new innovations, especially those resulting from broad-based changes in technology. States without a rich supply of STEM-skilled individuals are seeing flat or even decreasing prosperity because they are not able to compete in the national and global economy, where an understanding of how to use technology, research, and adapt to rapid change are key elements for success.<sup>iii</sup>

There are ***two STEM educations*** to provide. One is rooted in specific content related to the four STEM disciplines: science, technology engineering, and math. This half of STEM education requires content fluency and achievement is usually defined by core academic standards. Long-term success is usually synonymous with the "STEM Pipeline," leading to concentrations in STEM academic disciplines, degrees and certifications, and direct entry into defined industries. The second STEM education is related to the holistic integration of the concepts learned in the four STEM subjects, including inquiry, design, problem-solving, research and data analysis. These skills are critical to success for all kinds of occupations and industries and are necessary to support both STEM economies.

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<sup>i</sup> *Help Wanted: Projections of Jobs and Education Requirements through 2018.* A. Carnevale, N. Smith, J. Strohl. Georgetown University Center on Education and the Workforce. 2011; *The Hidden STEM Economy.* Jonathan Rothwell, Brookings Institute. 2013.

<sup>ii</sup> Ibid.

<sup>iii</sup> *STEM.* A. Carnevale, N. Smith, M. Melton. Georgetown University Center on Education and the Workforce. 2011.