



Computer Science in K-12 STEM Education Critical for 21st Century Skills and Knowledge

Why Teach Computer Science at the K-12 Level?

Education leaders want to ensure curriculum is preparing students with the knowledge and skills they will need to succeed in the workforce or college. This intention is often squeezed by the limitations of the school day and fierce competition among subjects for inclusion. As education policymakers make tough decisions about which subjects will meet the needs of citizens and industry in the 21st Century, they want to know how a subject might make their students successful. Teaching computer science in K-12 meets students' needs in three ways:

- Students gain a deeper knowledge of the fundamentals of computing, which—as computing becomes ubiquitous—is a critical foundational knowledge that will serve them well throughout their lives
- Students are exposed to a field that drives innovation and in which job prospects remain strong despite the current extraordinary economic challenges
- Students gain critical knowledge and skills proven to bolster their success in higher education academic pursuits

Computer science education is strongly based upon the higher tiers of Bloom's cognitive taxonomy, as it involves design, creativity, problem solving, analyzing a variety of possible solutions to a problem, collaboration, and presentation skills. Through studying computer science, students develop and extend logical thinking and problem-solving skills. These skills can then be applied to real world problems—mathematical and otherwise. Further, students who take on high school computing classes and have previous experience with technology demonstrate improved readiness for postsecondary studies.

Computer science underpins the technology sector, which has made tremendous contributions to the domestic economy, as well as numerous other economic sectors that depend on innovative, highly skilled computer science graduates. Computing touches everyone's daily lives. Securing our cyber-infrastructure, protecting national security, and making our energy infrastructure more efficient are among numerous issues dependent on computing, computing literacy and a strong computing workforce.

We consider it critical that students be able to read and write, and understand the fundamentals of mathematics, biology, chemistry and physics. To be a well-educated citizen in today's computing-intensive world, students must have a deeper understanding of the fundamentals of computing as well. It is crucial that public education take on this charge.