The United States' persistent high unemployment rate masks a deepening workforce shortage in the high-skilled tech sector. Even as many Americans are out of work, there are too many unfilled jobs dependent on Science, Technology, Engineering, and Math (STEM) skills.

STEM jobs rank among the best-paying and fastest-growing jobs in the 21st century economy. Even outside of these fields, basic competencies in STEM are becoming increasingly important for jobs in every industry. Yet, the US lags behind other countries in preparing our youth to seize these opportunities, putting America's future economic competitiveness in jeopardy and leaving a generation of young Americans behind.

Wisconsin is in no way immune to these challenges. To continue to build upon its strong economic foundations in STEM-dependent industries, including advanced manufacturing, dairy and food processing, and health care, and to give the next generation of Wisconsinites a shot at success, the inSPIRE STEM USA coalition encourages Wisconsin policymakers to strengthen the STEM education pipeline, today and over the long term.

STEM fields: A critical and growing part of Wisconsin's economy.

The number of STEM jobs in Wisconsin is projected to increase by 12% from 2008-2018, compared to 6.4% job growth for Wisconsin's economy as a whole.[1]

By 2018, 43% of STEM jobs in Wisconsin will be in computing occupations.[2]

STEM-dependent industries: Some of the fastest-growing and highest-paying jobs in Wisconsin.

Among the top ten jobs in Wisconsin with the highest projected growth rates over the next decade, five are in STEM fields.[3]

Over 144,000 STEM-related jobs will need to be filled in Wisconsin by 2018, 92% of which will require postsecondary education and training.[4]

On average, US workers in STEM fields earned $72,569 in 2008, compared to $40,947 for all workers.[5]

Demand for qualified STEM workers in the state is failing to meet demand.

The unemployment rate in Wisconsin's STEM industries stands at 3%, compared to 8% in non-STEM industries.[6]

Wisconsin employers requested on average 20,629 H-1B visas for foreign, temporary workers per year in 2010 and 2011, 70% of which were requested to fill STEM jobs.[7]

Too few Wisconsin students are gaining the skills needed for 21st century STEM jobs.

Only 41% of Wisconsin 8th graders tested at or above the proficient level in math, and only 40% met the proficient standard in science in 2011.[8]

Only 1 in 20 Wisconsin high schools are offering an AP Computer Science course this school year. AP CS exams represented just 0.5% of all AP exams taken in Wisconsin last year, and only 207 students statewide passed the AP CS exam, of whom only 23 were women and only 21 were minority students.[9]

Even though women made up 49% of Wisconsin's college-age population in 2009, women received only 32% of postsecondary degrees and certificates in STEM. Latinos earned only 2% of all STEM degrees despite representing 6% of the college-age population.[10]

To remain globally competitive, Wisconsin must strengthen the STEM education pipeline and improve college access and completion rates.

By 2020, 64% of jobs in Wisconsin will require a career certificate or college degree, but today only 40% of Wisconsin adults have an associate's degree or higher.[11]

Only 58% of full-time Wisconsin college students earn their bachelor's degree within six years.[12]

Bachelor's degrees in computer science, engineering, natural sciences and math accounted for only 14.8% of all bachelor's degrees conferred in Wisconsin in 2009.[13]

InSPIRE STEM USA Coalition Partners

inSPIRE STEM USA is supported by a broad array of business, education, and civil rights groups dedicated to promoting America's economic competitiveness and setting up the next generation for success. Find out more about the coalition's efforts to address our country's STEM skills crisis at www.inspirestemusa.org.

The American Society for Biochemistry and Molecular Biology

Asian & Pacific Islander

American Scholarship Fund (APIASF)

Campaign for Environmental Literacy

Caterpillar

Computing in the Core

Council of Chief State School Officers

Education Development Center

Excelencia in Education

Expedia Inc

HandsOn Science Partnership

Hispanic Association of Colleges and Universities

Hispanic Heritage Foundation

The Hispanic Institute

HR Policy Association

IBM

Intel

The Jason Project

League of United Latin American Citizens

Microsoft

National Association of Manufacturers

National Council of Teachers of Mathematics (NCTM)

National Hispanic Council on Aging

National Hispanic Medical Association

National Gay and Lesbian Chamber of Commerce (NGLCC)

National Puerto Rican Association

National Science Teachers Association

The New England Council

Sabre Holdings

STEMconnector

United States Hispanic Chamber of Commerce

[1] http://cew.georgetown.edu/stem/states/. See also: http://cew.georgetown.edu/jobs2018/states/
[2] Ibid.
[3] http://www.projectionscentral.com/
[4] http://cew.georgetown.edu/stem/states/
[5] http://www.stemconnector.org/sites/default/files/sbs/ASTRA%20STEMEd%20Wisconsin%202011.pdf
[6] http://vitalsigns.changetheequation.org/
[7] http://www.brookings.edu/research/reports/2012/07/18-h1b-visas-labor-immigration#profile
[8] http://nces.ed.gov/nationsreportcard/naepdata/
[9] http://nces.ed.gov/globallocator/. See also: https://apcourseaudit.epiconline.org/ledger/search.php and http://www.collegeboard.com/student/testing/ap/exgrd_sum/2012.html
[10] http://vitalsigns.changetheequation.org/
[11] http://www.completecollege.org/state_data/
[12] Ibid.
[13] http://www.nsf.gov/statistics/seind12/c8/c8i.htm
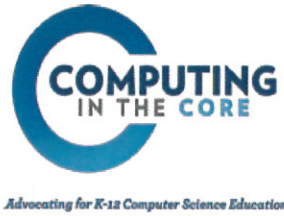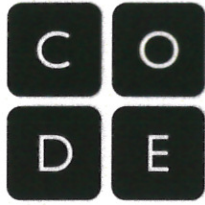
Representative Steve Kestell
Chair, Wisconsin Assembly Committee on Education
Room 212 North
State Capitol
PO Box 8952
Madison, WI 53708

Dear Chairman Kestell,

Code.org and Computing in the Core strongly support Amendment 1 for Assembly Bill 489, which would permit a local school board to count computer science towards one credit of mathematics as part of the legislation's expansion of math and science graduation requirements. The proposed legislation will help foster the growth of computer science offerings in Wisconsin's K-12 system.

Computing is a foundational skill for K-12 students. It develops students' computational and critical thinking skills and teaches them how to create—not just use—new technologies. Computer science is driving job growth and innovation in Wisconsin and throughout the United States. More than half of projected jobs in STEM fields are in computing occupations, and computer science is one of the most desirable degrees from new college graduates. This fundamental knowledge is critical to preparing students for success in the workforce, regardless of their ultimate field of study or occupation.

According to Georgetown University's Center on Education and the Workforce, the state of Wisconsin will need to fill 133,780 STEM-related jobs by 2018. Forty-three percent of these jobs will be in computing. The proposed changes to high school graduation requirements will better prepare Wisconsin's students for high paying, in-demand careers and position Wisconsin as a national leader in K-12 computer science education.

Thank you for your efforts to give young people in Wisconsin the education they need to be successful when they leave the K-12 system. Code.org and Computing in the Core and its members support giving all of them access to Computer Science in the State's schools.

If you have any questions, please contact Cameron Wilson at Cameron@code.org or Della Cronin at Della@computinginthecore.org. Thank you for your consideration of this matter.

Sincerely,

Cameron Wilson   Della Cronin
Chief Operating Officer   Spokesperson
Code.org   Computing in the Core
www.code.org   www.computinginthecore.org

cc: Governor Scott Walker

Computing in the Core (CinC) is a non-partisan advocacy coalition of associations, corporations, scientific societies, and other non-profits that strive to elevate computer science education to a core academic subject in K-12 education, giving young people the college- and career-readiness knowledge and skills necessary in a technology-focused society. Current membership includes: Anita Borg Institute for Women and Technology, Association for Computing Machinery, Code.org, the College Board, Computing Research Association, Computer Science Teachers Association, Google, IEEE Computer Society, Microsoft, National Center for Women and Information Technology, National Council of Teachers of Mathematics, National Math and Science Initiative, National Science Teachers Association, and SAS.

Ideas for Securing U.S. Competitiveness and Economic Growth

Computer Science is driving innovation and economic growth in Wisconsin and across the country. By the end of the decade, jobs in computing will comprise over half of all jobs in science, technology, engineering, and mathematics (STEM) fields in the country. Furthermore, Computer Science skills prepare students for careers in a variety of sectors beyond information technology, such as manufacturing, healthcare, and defense.

If current trends continue, however, Wisconsin's students will not be prepared for the STEM jobs of the future. Despite Computer Science's central importance to the state's high tech economy, only a small fraction of Wisconsin's students are taking Computer Science courses at the K-12 level.

By 2018, **43%** of STEM jobs in Wisconsin are projected to be in computing occupations, but last year AP Computer Science tests represented only **1%** of all math and science AP tests taken in the state.
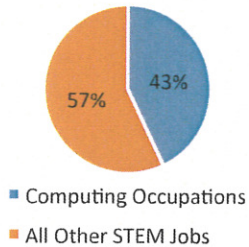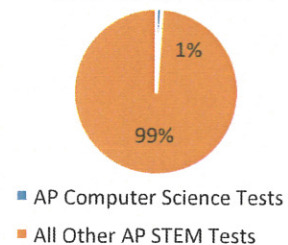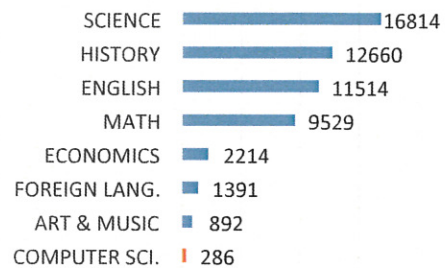
Making Computer Science count as a high school math or science credit is an essential incentive for more students to gain the computing skills that can prepare them for success in the global economy. It should come as no surprise that AP Computer Science tests represented only 0.5% of AP tests taken in Wisconsin in 2012 when AP CS will get students just as close to graduation as ceramics or woodworking.

Making Computer Science count has been effective in increasing enrollment in Computer Science courses. In the 13 states that currently count CS toward a math or science credit, the average CS class size is 53% higher than in states where CS is only an elective.

WI STEM Jobs: 2018

43%
57%

- Computing Occupations
- All Other STEM Jobs

WI AP Tests: 2012

1%
99%

- AP Computer Science Tests
- All Other AP STEM Tests

AP Tests Taken in WI, 2012

SCIENCE	16814
HISTORY	12660
ENGLISH	11514
MATH	9529
ECONOMICS	2214
FOREIGN LANG.	1391
ART & MUSIC	892
COMPUTER SCI.	286

*According to TechAmerica's Cyberstates report, the high-tech industry in Wisconsin is responsible for 81,257 jobs and wages totaling $5.2 billion per year. The average high-tech worker earns **67% more** than the average private sector worker.*

The economic future of the state of Wisconsin is intrinsically linked to the future of Computer Science education. **To expand access to CS education is to expand economic opportunity for the next generation.**

Learn more about expanding access to Computer Science education and about Making CS Count at Code.org or ComputingintheCore.org. Contact: Cameron Wilson at cameron@code.org *or Della Cronin at* della.cronin@computinthecore.org.

Supporters of Making Computer Science Count! Computing in the Core, Code.org, Association for Computing Machinery, Microsoft, Google, Dropbox, Computer Science Teachers Association, National Center for Women and Information Technology, IEEE Computer Society, National Math and Science Initiative, Computing Research Association, College Board, Anita Borg Institute for Women and Technology, SAS, National Council of Teachers of Mathematics, National Science Teachers Association, STAND for Children, Digital Learning Now!, American Association of University Women

Mathematics Graduation Requirements:
# Classes 2006 Through 2011
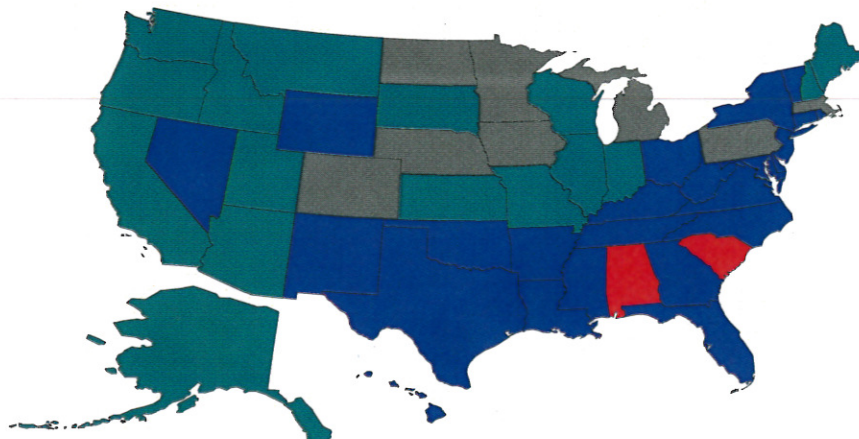
By Kyle Zinth

Updated August 2006

While not a uniform development across all states, many states are increasing the number of mathematics units a student must complete to earn a high school diploma through the class of 2011. This document provides an overview of the trend. Listed requirements do not take into account the differentiated diplomas that exist in some states, and instead focus on the minimum requirements needed to earn a high school diploma. The District of Columbia is treated as a state for the purposes of this document.

Number of States Requiring Mathematics Units for Graduation: Classes 2006-2011
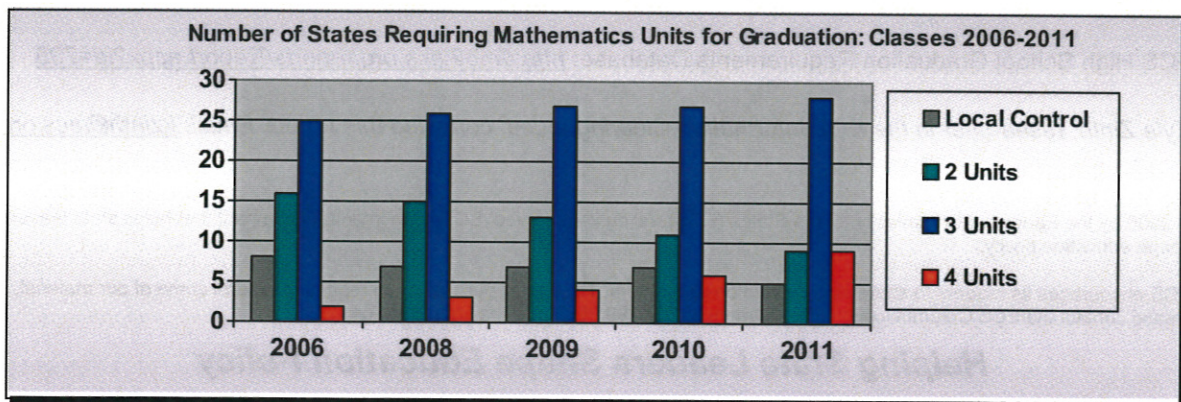
Current Requirements in Place for the Class of 2006:

Required Units

- Local (8 States)
- 2 (16 States)
- 3 (25 States)
- 4 (2 States)

Requirements to Take Effect by the Class of 2011:

Required Units

- Local (5 States)
- 2 (9 States)
- 3 (28 States)
- 4 (9 States)

Source:

ECS High School Graduation Requirements Database: *http://mb2.ecs.org/reports/Report.aspx?id=735*

Kyle Zinth, researcher in the ECS Information Clearinghouse, compiled this report. Email: kzinth@ecs.org

Helping State Leaders Shape Education Policy

Science Graduation Requirements:
Classes 2006 Through 2011
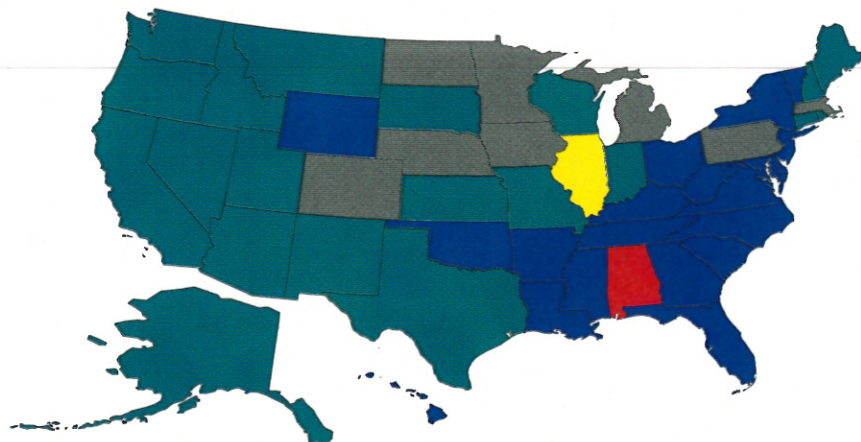
By Kyle Zinth

Updated August 2006

While not a uniform development across all states, many states are increasing the number of science units a student must complete to earn a high school diploma through the class of 2011. This document provides an overview of this trend. Listed requirements do not take into account the differentiated diplomas that exist in some states, and instead focus on the minimum requirements needed to earn a high school diploma. The District of Columbia is treated as a state for the purposes of this document.
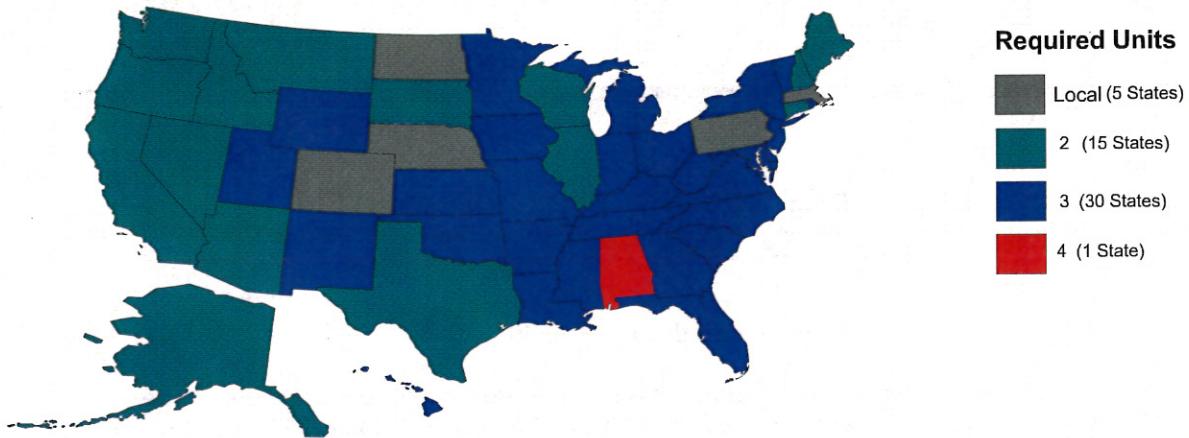

Number of States Requiring Science Units for Graduation: Classes 2006-2011
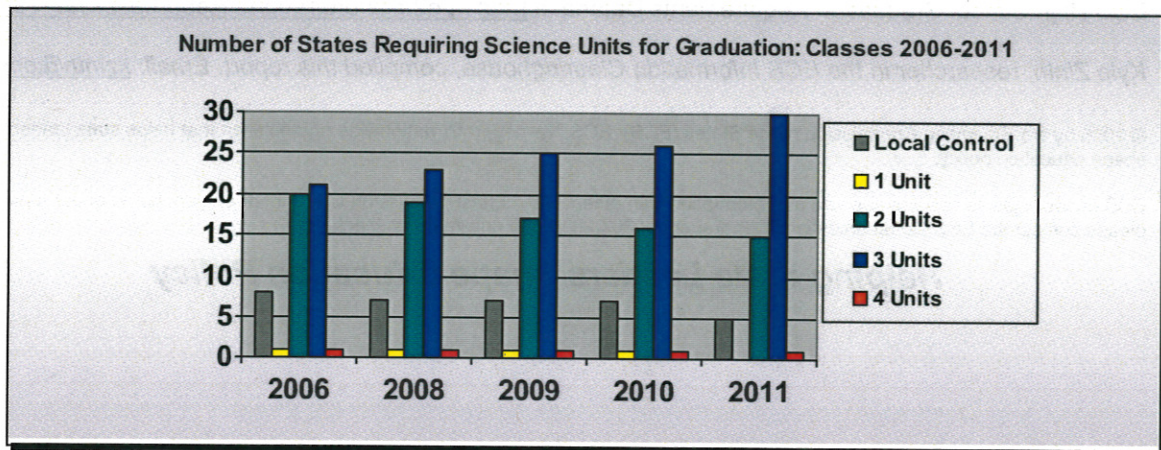
Current Requirements for the Class of 2006:

Required Units

- Local (8 States)
- 1 (1 State)
- 2 (20 States)
- 3 (21 States)
- 4 (1 State)

Requirements to Take Effect by the Class of 2011:

Required Units

Local (5 States)

2 (15 States)

3 (30 States)

4 (1 State)

Source:
ECS High School Graduation Requirements Database http://mb2.ecs.org/reports/Report.aspx?id=735

Kyle Zinth, researcher in the ECS Information Clearinghouse, compiled this report. Email: kzinth@ecs.org

Helping State Leaders Shape Education Policy

AB 489: Computer Science
Testimony of State Representative John Klenke
Assembly Committee on Education
November 6, 2013

Thank you, Chair Kestell and members of the committee for scheduling this

hearing on Assembly Bill 489. Senator Olsen has also submitted testimony

regarding the Senate companion bill number 51. His focus was on the skills gap in

Wisconsin and the need for a high school diploma to be more meaningful. I

encourage you to read his testimony, and to eliminate being redundant I will take a

different track.

This bill gives students the opportunity to branch into the growing field of

Computer Sciences. This degree is one of the highest paying college majors and is

growing twice as fast as the national average according to a recent Georgetown

University study. Of all jobs regarding Math and Science, 60% of them require

Computer Sciences while only 2% of Math and Science Graduates have a

Computer Science degree.

Additionally, familiarizing students with their chosen industry is beneficial

to the growing technology sector as many manufacturing jobs require prior

experience with equipment that is computer operated. Allowing CTE students to

take classes that are relevant to their chosen career paths is advantageous to their

future career prospects. For example, many manufacturing and machining jobs require experience with CNC lathes. This essential skill can be acquired in a CTE class where a student is focused on machining or manufacturing as a vocation.

I believe we can also all agree that giving students the best set of skills to succeed in the workforce is vital. By creating a requirement of 3 math credits we are expanding the level of knowledge on the core components of education.