VITAL SIGNS

UNITED STATES

U.S. Business leaders cannot find the science, technology, engineering and mathematics (STEM) talent they need to stay competitive. Students' lagging performance in K-12 is a critical reason why. The good news is that the nation's most effective STEM education programs can help turn the tide.

We have our work cut out for us. Not enough students, particularly students of color, have access to challenging math and science content that would prepare them for STEM careers. Far too few eighth graders have teachers who majored in math or science. Teachers of low-income and minority students often lack the resources and support they need. Years of hard work have improved K-12 student performance in math and science, but not fast enough.

Programs in STEMworks, CTEq's honor roll of STEM education programs that have proven their effectiveness, have the potential to address these and other challenges in states across the country.

THE UNITED STATES NEEDS MORE STEM TALENT

STEM fields are growing in United States

Between 2014 and 2024:

STEM jobs will grow

16%

Non-STEM jobs will grow

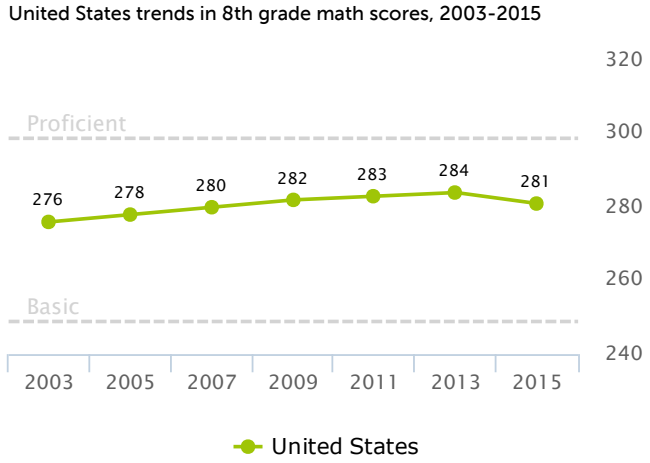
11%

THE STEM SKILLS SHORTAGE STARTS EARLY

Progress in math has faltered

After years of progress in K-12 math, U.S. students have lost ground.

Trends in 8th grade math scores, 2003-2015

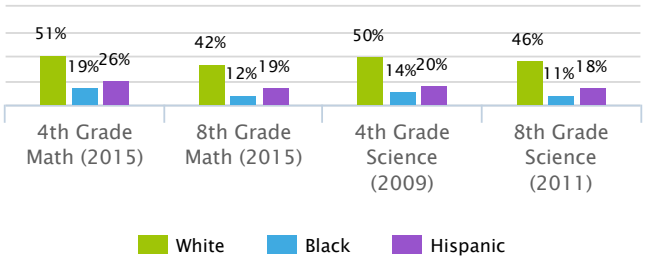


SOURCE: U.S. Department of Education, 2015

Students of color lag farthest behind

Closing achievement gaps must remain a priority.

Percentage of United States students at or above proficient, by race/ethnicity



SOURCE: U.S. Department of Education, 2009–2015

*Data not available or reporting requirements not met.

UNITED STATES

VITAL SIGNS

The U.S. must plug the gaps in the STEM pipeline

The national STEM pipeline loses young people at every level of the education system. Some fail to graduate from high school and many do not finish college, which narrows the pipeline of students who can gain advanced STEM skills. The 2-year college graduation rate is particularly low. Of those students who do graduate, few get a post-secondary degree in STEM.

What percentage of high school students graduates? (2013-2014)

United States

Of high school graduates who enter a 4-year degree program, what percentage graduate? (2012-2013)

United States

Of high school graduates who enter a 2-year associate's degrees program, what percentage graduate? (2012-2013)

United States

What percentage of certificates and degrees is in STEM fields? (2012-2013)

United States

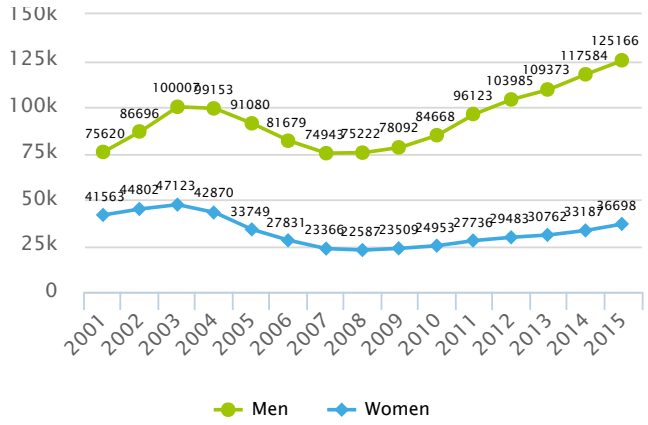
TAP THE NATION'S FEMALE AND MINORITY TALENT

Together, females and minorities make up more than half of The nation's population, yet they are much less likely to earn STEM degreesor become STEM professionals. Closing these gaps can pay big dividends in The U.S..

Women have lost ground in computing

The available talent in computer science would rise dramatically if The U.S. simply closed the gender gap in these subjects.

Number of computing degrees/certificates in United States

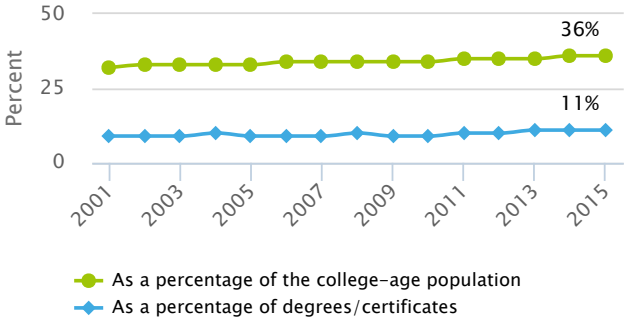


SOURCE: U.S. Department of Education, 2009–2015

People of color are not gaining ground in engineering degrees

It is critical to prepare and inspire many more students of color to pursue STEM subjects such as computer science and engineering.

Underrepresented minorities in United States earning engineering degrees/certificates



SOURCE: U.S. Department of Education, 2009–2015

*Data not available or reporting requirements not met.

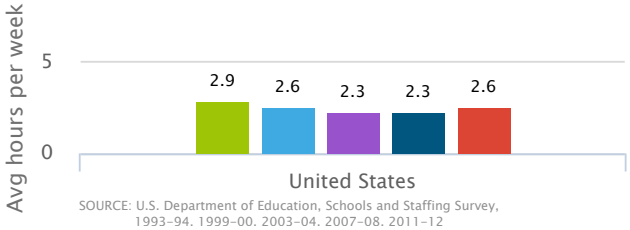
UNITED STATES VITAL SIGNS

GIVE STUDENTS ACCESS TO BETTER STEM LEARNING OPPORTUNITIES

Lack of access to such opportunities severely limits young people's college and career prospects.

The nation should make time for elementary science

Hours per week spent on science, grades 1-4

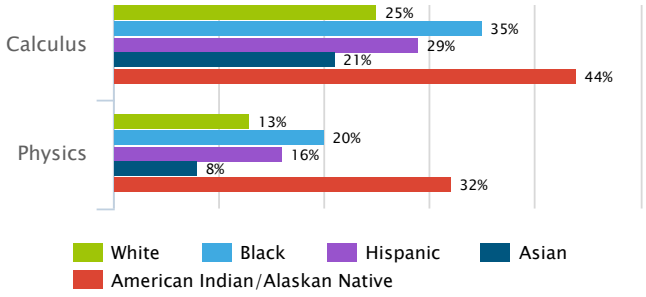


SOURCE: U.S. Department of Education, Schools and Staffing Survey, 1993-94. 1999-00. 2003-04. 2007-08. 2011-12

The U.S. should improve access to advanced courses

Many students lack access to such courses.

Students in United States schools that do not offer challenging math and science courses, 2009/10



Success in Advanced Placement courses can put more students on a path to STEM careers.

Of the high school graduating class of 2015 in United States:

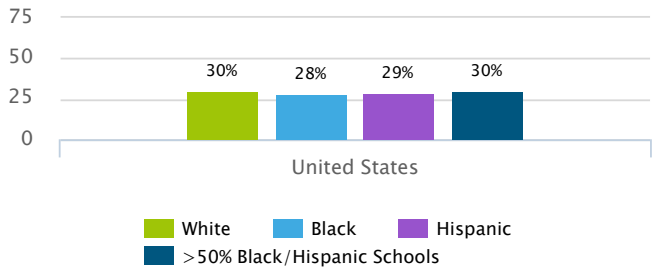
	Took AP Math Exam	Scored 3+ on AP Math Exam
All Students	14%	8%
White	14%	9%
Black	6%	2%
Hispanic	10%	3%
Asian	37%	26%
American Indian/Alaskan Native	6%	3%

DEVELOP AND RETAIN TALENTED STEM U.S. TEACHERS

Research shows that teachers' content knowledge and teaching experience can affect student performance

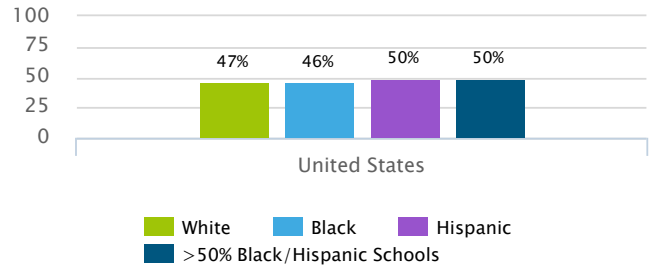
Boost teachers' content knowledge

Eighth-graders whose math teachers have an undergraduate major in math, 2015



SOURCE: U.S. Department of Education 2015

Eighth-graders whose science teachers have an undergraduate major in science, 2011

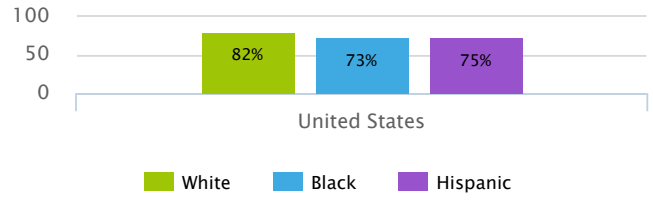


SOURCE: U.S. Department of Education 2015

Retain excellent teachers

Minority students are most likely to have inexperienced teachers

Eighth-graders whose teachers have 5+ years of experience teaching their subject



SOURCE: U.S. Department of Education 2015

CHANGE THE EQUATION

*Data not available or reporting requirements not met.

UNITED STATES

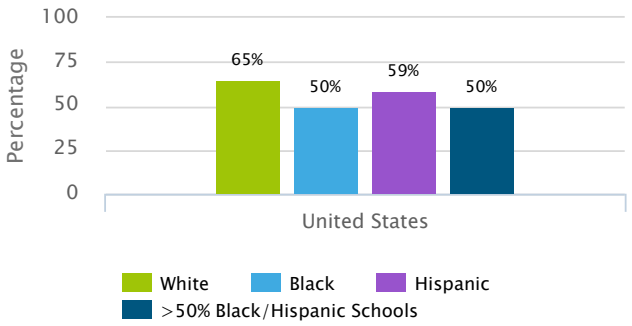
VITAL SIGNS

GIVE SCHOOLS AND TEACHERS THE RESOURCES THEY NEED

U.S. teachers need better resources, facilities, and teaching materials to succeed.

Too many teachers lack the tools of their trade

Eighth-graders whose science teachers say they have all or most of the resources they need, 2011

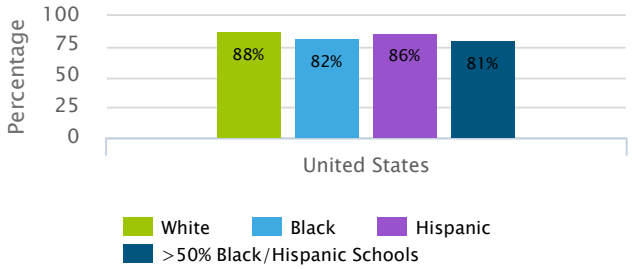


SOURCE: U.S. Department of Education, 2015

*Data not available or reporting requirements not met.

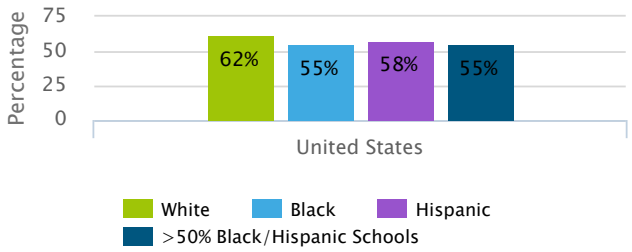
The nation should improve access to science resources

Eighth-graders whose schools have science labs, 2011



SOURCE: U.S. Department of Education, 2011

Eighth-graders whose schools report that supplies or materials for science labs are available "to a large extent," 2011



SOURCE: U.S. Department of Education, 2011

For the complete state report, methodology, and sources, see vitalsigns.changetheequation.org (vitalsigns.changetheequation.org)

STEMWORKS

Turn to STEMworks for proven solutions

The nation's children and youth need immmediate help to reach their potential. Change the Equation's STEMworks honor roll of proven STEM education programs features programs that have been rigorously vetted for effectiveness and address crticial issues as diverse as teacher training, school curriculum, and summer camp.

CHANGE THE EQUATION

Improving teaching and learning in science, technology, engineering and mathematics (STEM)
Change the Equation · 1101 K Street, NW, Suite 610 · Washington, DC 20005 · 202 626 5740