

VITAL SIGNS

TENNESSEE

Business leaders in Tennessee 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.

Students have made progress in math over the past decade, yet not enough students--least of all minorities--have the chance to learn challenging content to prepare them for college and careers. There is special cause for concern in science. Girls lag behind boys, not enough students conduct regular hands-on investigations and science teachers say they don't have the resources they need.

TENNESSEE NEEDS MORE STEM TALENT

STEM fields are growing in Tennessee

Between 2017 and 2027:

STEM jobs will grow

Non-STEM jobs will grow

17%

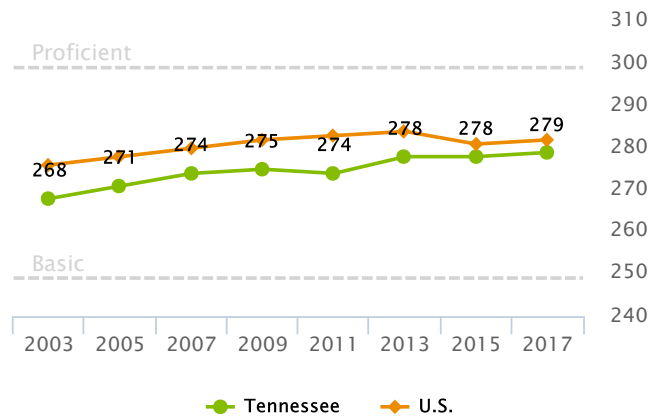
9%

THE TENNESSEE STEM SKILLS SHORTAGE STARTS EARLY

The state has made progress in math

Tennessee has made progress in K-12 math, but it still has far to go.

Trends in 8th grade math scores, 2003-2017

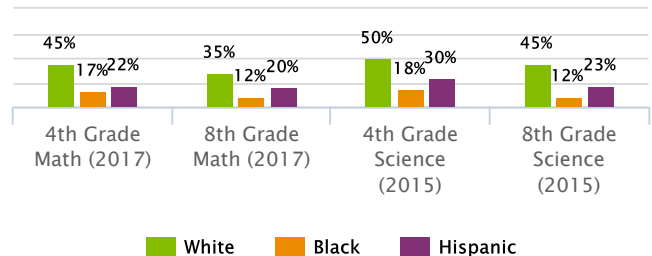


SOURCE: U.S. Department of Education, 2003-2017

Students of color lag farthest behind

Closing achievement gaps must remain a priority.

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



SOURCE: U.S. Department of Education, 2015-2017

*Data not available or reporting requirements not met.

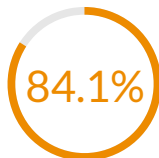
The state must plug the gaps in the STEM pipeline

Tennessee loses STEM talent 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 two-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 graduate? (2014-2015)

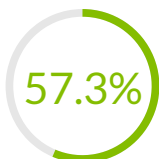


Tennessee

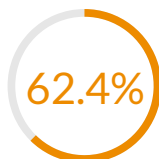


United States

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



Tennessee

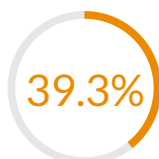


United States

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

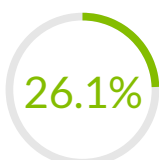


Tennessee

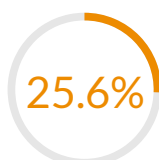


United States

What percentage of certificates and degrees is in STEM fields? (2014-2015)



Tennessee



United States

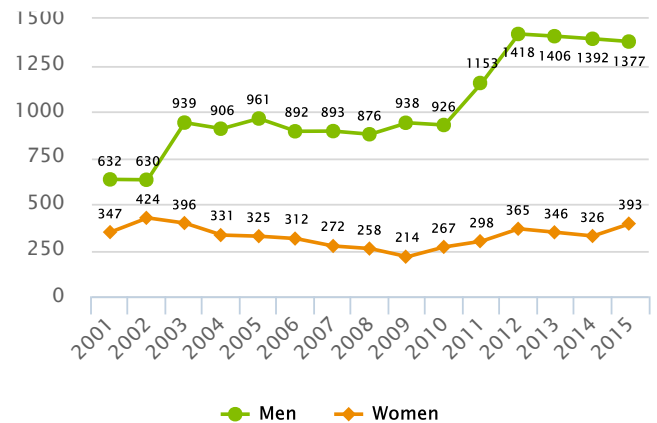
TAP TENNESSEE'S FEMALE AND MINORITY TALENT

Together, females and minorities make up more than half of Tennessee's population, yet they are much less likely to earn STEM degrees or become STEM professionals. Closing these gaps can pay big dividends in the state.

Women have lost ground in computing

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

Number of computing degrees/certificates in Tennessee

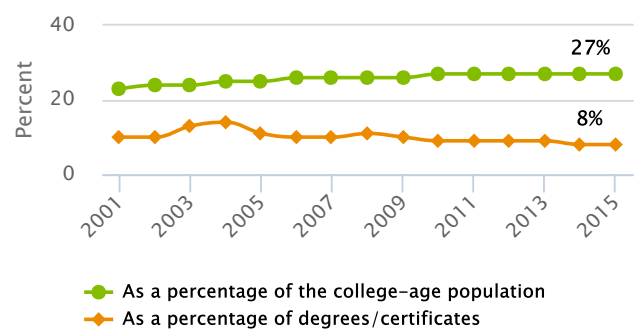


SOURCE: U.S. Department of Education, 2001-2015

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 Tennessee earning engineering degrees/certificates



SOURCE: U.S. Department of Education, 2001-2015

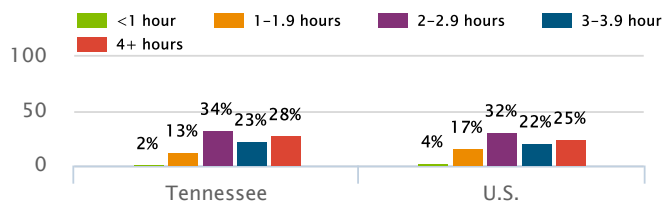
*Data not available or reporting requirements not met.

GIVE TENNESSEE STUDENTS ACCESS TO BETTER STEM LEARNING OPPORTUNITIES

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

The state should make time for elementary science

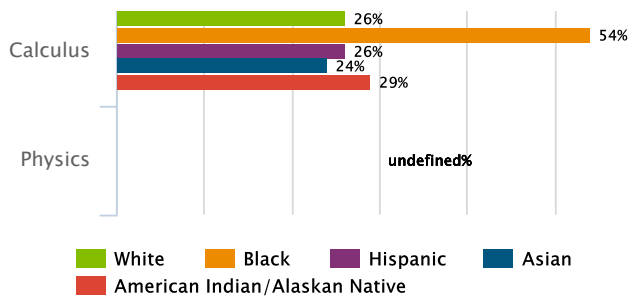
Hours per week spent on science, grades 1-4, 2015



The state should improve access to advanced courses

Many students lack access to such courses.

Students in Tennessee high schools that do not offer challenging math and science courses, 2013/14



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

Of the high school graduating class of 2015 in Tennessee:

	Took AP Math Exam	Scored 3+ on AP Math Exam
All Students	6%	3%
White	7%	4%
Black	3%	1%
Hispanic	6%	2%
Asian	31%	18%
American Indian/Alaskan Native	12%	3%

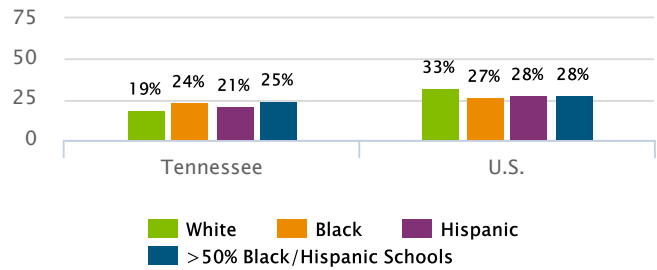


DEVELOP AND RETAIN TALENTED STEM TEACHERS IN TENNESSEE

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

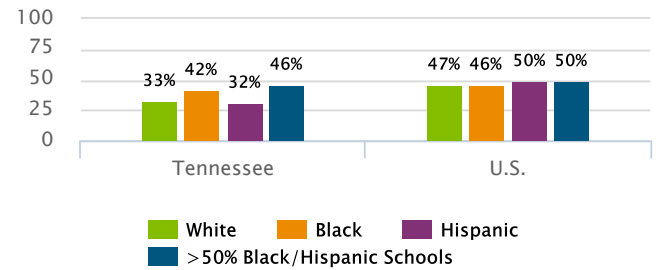
Boost teachers' content knowledge

Eighth-graders whose math teachers have an undergraduate major in math, 2017



SOURCE: U.S. Department of Education 2017

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

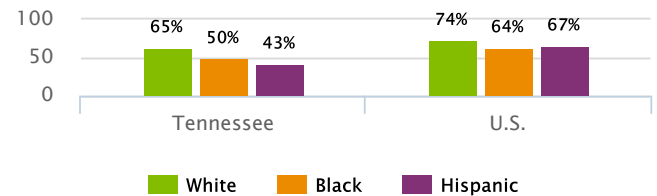


SOURCE: U.S. Department of Education 2015

Retain excellent teachers

Minority students are most likely to have inexperienced teachers

Eighth-graders whose math teachers have 6+ years of experience teaching their subject



SOURCE: U.S. Department of Education 2017

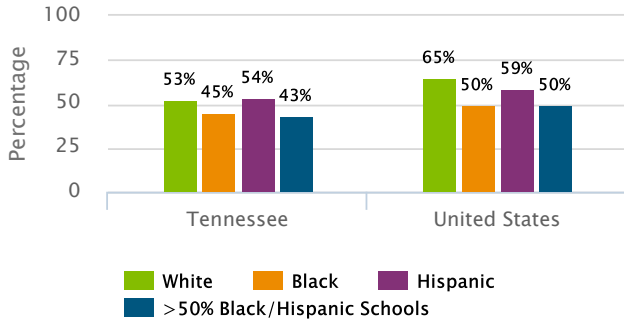
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GIVE TENNESSEE SCHOOLS AND TEACHERS THE RESOURCES THEY NEED

Teachers in Tennessee need better resources, facilities and teaching materials to succeed.

Too many teachers lack the tools of their trade

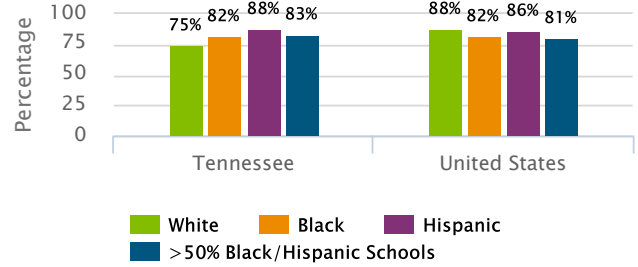
Eighth-graders whose science teachers say they have all or most of the resources they need, 2015



SOURCE: U.S. Department of Education, 2015

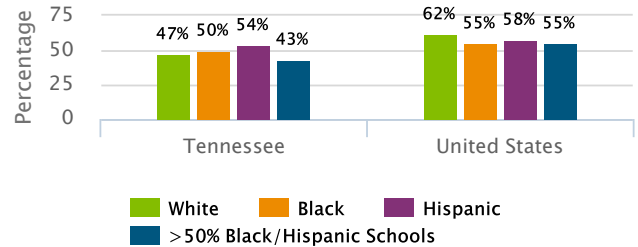
The state should improve access to science resources

Eighth-graders whose schools have science labs, 2015



SOURCE: U.S. Department of Education, 2015

Eighth-graders whose schools report that supplies or materials for science labs are available "to a large extent," 2015



SOURCE: U.S. Department of Education, 2015

*Data not available or reporting requirements not met.

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

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Education Commission of the States, 700 Broadway, Suite 810, Denver, CO 80203, 303.299.3600