

VITAL SIGNS

MONTANA

Business leaders in Montana 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.

Montana eighth-graders have made only halting progress in math over the past decade, but the state boasts some of the nation's smallest racial and ethnic achievement gaps in math and science. Still, low-income students lag behind, and not enough students have the chance to learn challenging content to prepare them for college and careers. Most of the state's eighth graders don't have teachers with an undergraduate major in math or science.

MONTANA NEEDS MORE STEM TALENT

STEM fields are growing in Montana

Between 2017 and 2027:

STEM jobs will grow

Non-STEM jobs will grow

13%

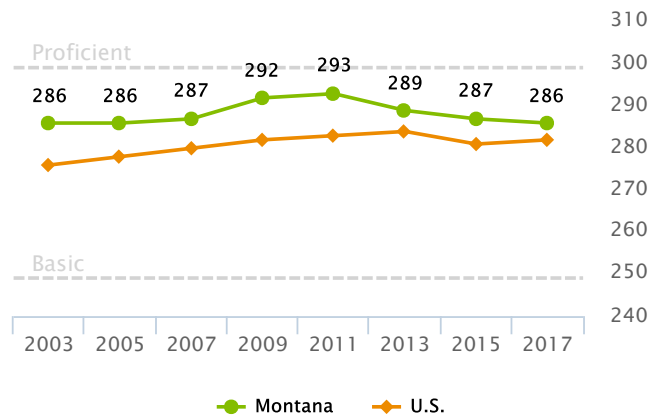
10%

THE MONTANA STEM SKILLS SHORTAGE STARTS EARLY

The state has made little progress in math

After peaking in 2011, eighth-grade scores returned to 2003 levels.

Trends in 8th grade math scores, 2003-2017

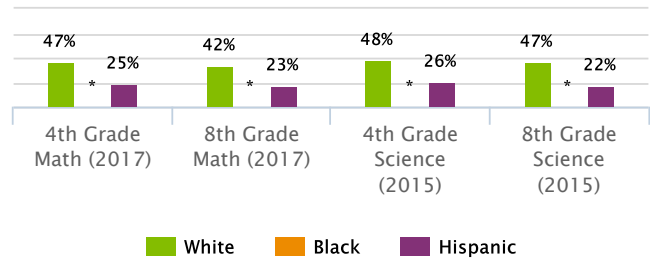


SOURCE: U.S. Department of Education, 2003-2017

Students of color lag farthest behind

Closing achievement gaps must remain a priority.

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



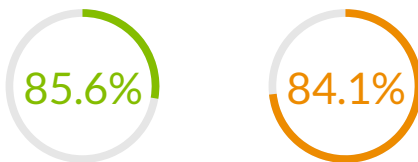
SOURCE: U.S. Department of Education, 2015-2017

*Data not available or reporting requirements not met.

The state must plug the gaps in the STEM pipeline

The Montana 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. Of those students who do graduate, few get a post-secondary degree in STEM.

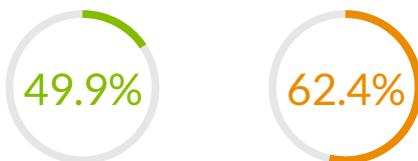
What percentage of high school students graduate? (2014-2015)



Montana

United States

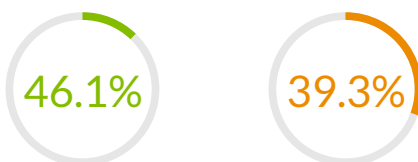
Of high school graduates who enter a 4-year degree program, what percentage graduate? (2012-2013)



Montana

United States

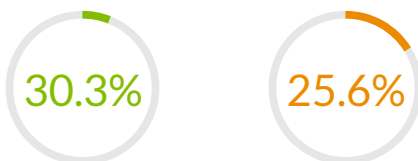
Of high school graduates who enter a 2-year associate's degrees program, what percentage graduate? (2012-2013)



Montana

United States

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



Montana

United States

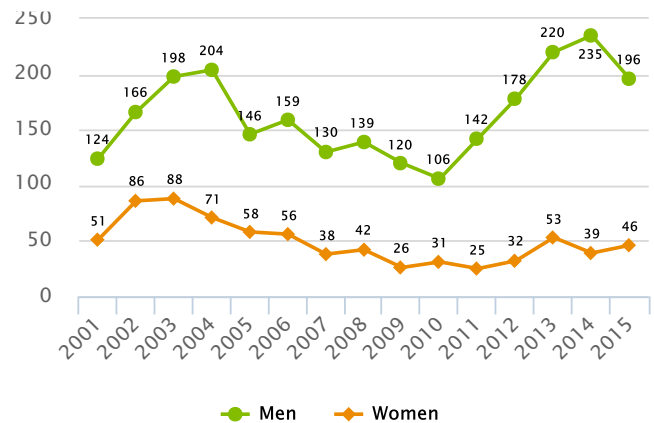
TAP MONTANA'S FEMALE AND MINORITY TALENT

Together, females and minorities make up more than half of Montana'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 Montana

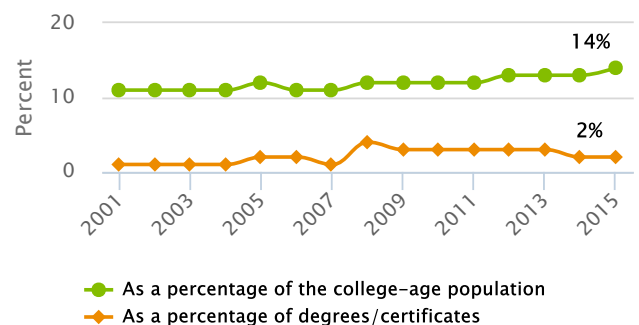


SOURCE: U.S. Department of Education, 2001-2015

People of color are/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 Montana earning engineering degrees/certificates



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

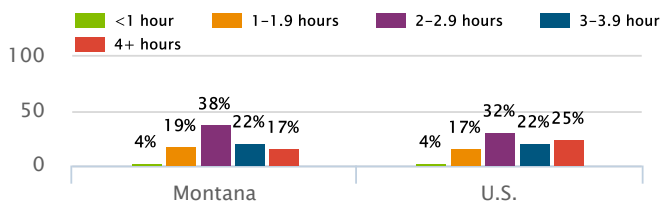
*Data not available or reporting requirements not met.

GIVE MONTANA 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

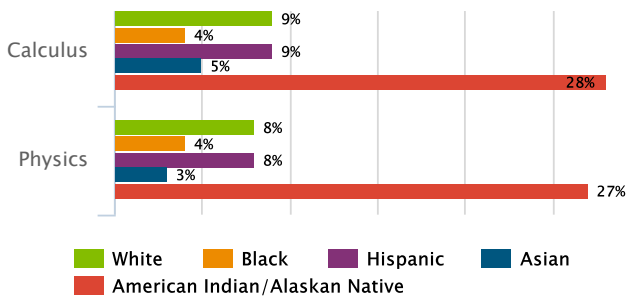
Hours per week spent on science, grades 1-4, 2015



The state should improve access to advanced courses

Many students lack access to such courses.

Students in Montana 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 Montana:

	Took AP Math Exam	Scored 3+ on AP Math Exam
All Students	9%	5%
White	9%	5%
Black	6%	2%
Hispanic	4%	2%
Asian	24%	14%
American Indian/Alaskan Native	2%	1%

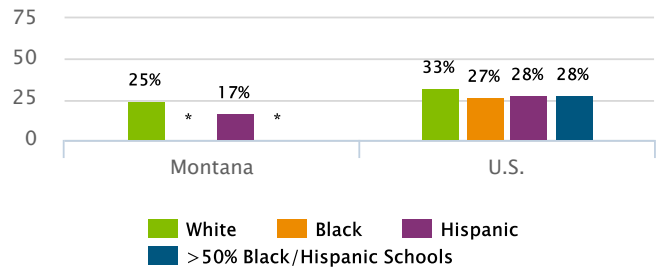


DEVELOP AND RETAIN TALENTED STEM TEACHERS IN MONTANA

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

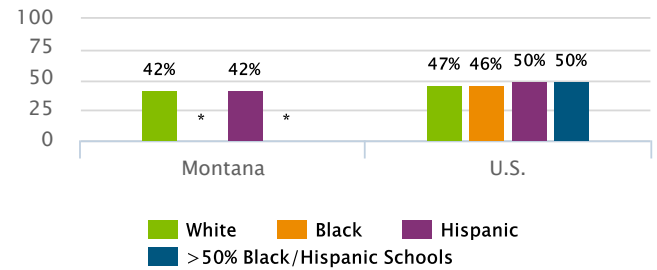
Boost teachers' content knowledge

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

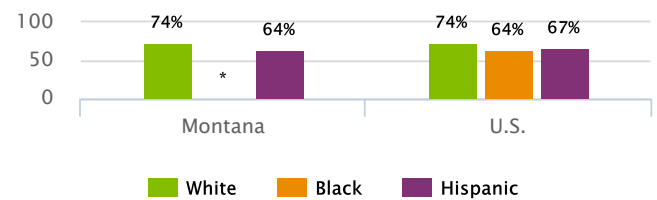


SOURCE: U.S. Department of Education 2015

Retain excellent teachers

Research shows that new teachers are less effective than teachers with three to five years of experience.

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



SOURCE: U.S. Department of Education 2017

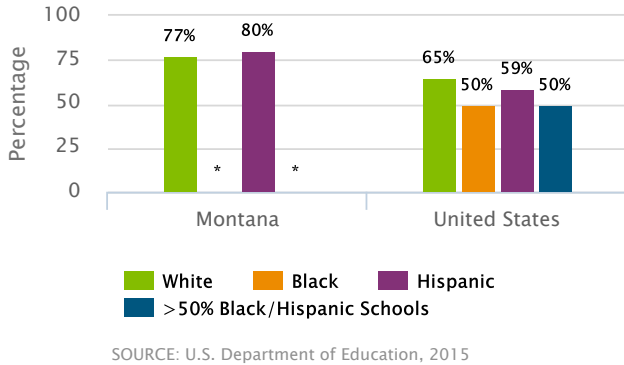
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GIVE MONTANA SCHOOLS AND TEACHERS THE RESOURCES THEY NEED

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

Too many teachers lack the tools of their trade

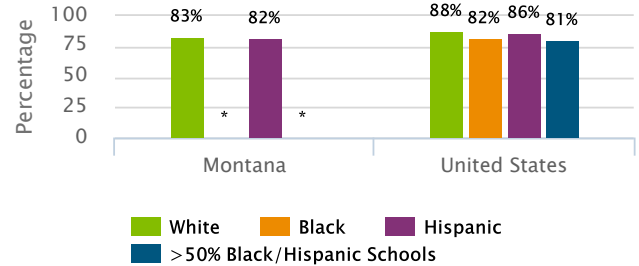
Eighth-graders whose science teachers say they have all or most of the resources they need, 2015



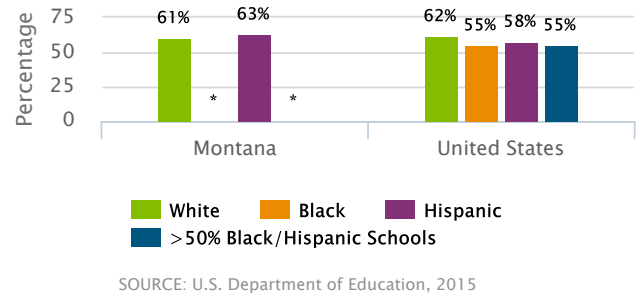
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The state should improve access to science resources

Eighth-graders whose schools have science labs, 2015



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



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

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