Business leaders in Ohio 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.

Ohio Students have made some progress in math over the past decade, yet not enough students—all minorities—have the chance to learn challenging content to prepare them for college and careers. Few eighth graders—especially low-income students—have teachers with an undergraduate major in math or science. Science teachers of low-income, black and Hispanic students are most likely to say they don’t have the resources they need, and their schools are most likely to lack facilities and materials for science instruction.

The state has made progress in math
After years of progress, however, students have lost ground.
Trends in 8th grade math scores, 2003-2017

Students of color lag farthest behind
Closing achievement gaps must remain a priority.
Percentage of Ohio students at or above proficient, by race/ethnicity


White Black Hispanic

48% 47% 48% 45%
15% 12% 9% 10%
24% 28% 28% 27%

VITAL SIGNS

THE OHIO STEM SKILLS SHORTAGE STARTS EARLY

OHIO NEEDS MORE STEM TALENT

STEM fields are growing in Ohio
Between 2017 and 2027:

STEM jobs will grow Non-STEM jobs will grow

9% 3%


*Data not available or reporting requirements not met.

For the complete state report, methodology, and sources, see vitalsigns.ecs.org (vitalsigns.ecs.org)
The state must plug the gaps in the STEM pipeline
The Ohio STEM pipeline loses young people at every level of the education system. Low graduation rates from high school and college narrow 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)

Ohio: 83.5%
United States: 84.1%

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

Ohio: 58.6%
United States: 62.4%

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

Ohio: 33.6%
United States: 39.3%

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

Ohio: 30.4%
United States: 25.6%

TAP OHIO’S FEMALE AND MINORITY TALENT
Together, females and minorities make up more than half of Ohio’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 Ohio

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 Ohio earning engineering degrees/certificates

*Data not available or reporting requirements not met.

For the complete state report, methodology, and sources, see vitalsigns.ecs.org
**DEVELOP AND RETAIN TALENTED STEM TEACHERS IN OHIO**

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

![Graph showing distribution of hours spent on science, grades 1-4, 2015](image)

**The state should improve access to advanced courses**

Many students lack access to such courses.

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

![Graph showing distribution of high school students taking AP Math Exam](image)

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

Of the high school graduating class of 2015 in Ohio:

<table>
<thead>
<tr>
<th></th>
<th>Took AP Math Exam</th>
<th>Scored 3+ on AP Math Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Students</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>White</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>Black</td>
<td>4%</td>
<td>1%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>9%</td>
<td>5%</td>
</tr>
<tr>
<td>Asian</td>
<td>46%</td>
<td>34%</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>15%</td>
<td>8%</td>
</tr>
</tbody>
</table>

**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

![Graph showing high school students scoring 5 on AP Calculus](image)

*Data not available or reporting requirements not met.*
GIVE OHIO SCHOOLS AND TEACHERS THE RESOURCES THEY NEED

Teachers in Ohio 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

<table>
<thead>
<tr>
<th></th>
<th>Ohio</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>54%</td>
<td>59%</td>
</tr>
<tr>
<td>Black</td>
<td>31%</td>
<td>50%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2%</td>
<td>50%</td>
</tr>
<tr>
<td>&gt;50% Black/Hispanic Schools</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

*Data not available or reporting requirements not met.

The state should improve access to science resources

Eighth-graders whose schools have science labs, 2015

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>65%</td>
</tr>
<tr>
<td>United States</td>
<td>66%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>50%</td>
</tr>
<tr>
<td>United States</td>
<td>52%</td>
</tr>
</tbody>
</table>

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

Education Commission of the States serves as a partner to state policymakers by providing personalized support and helping education leaders come together and learn from one another. Through our programs and services, policymakers gain the insight and experience needed to create effective education policy.