Texas Lone Star STEM

Michelle Sedberry, STEM Coordinator
michelle.sedberry@tea.texas.gov
• National Landscape for STEM
• Texas Landscape for STEM
• Region 1 Labor Market Data
• PK-12 STEM Education Vision in Texas
National STEM Landscape
• **2010** President Obama: *Prepare and Inspire: K-12 Education in STEM for America’s Future.*

• **2015** President Obama: 10-year vision for STEM education in the report *STEM 2026: A Vision for Innovation in STEM Education*

• **2018** President Trump: 5-year plan with accountability measures for each state. December 2019 will be the first year of reporting. Each state including Texas was involved in deciding the measures.

• **49 States have an active strategic K-12 STEM plan.**
  - 49 states have anchored STEM skills and Engineering Design Process in Science standards. Texas is writing a plan currently.
Goals for American STEM Education

• Build strong foundations in STEM literacy
• Increase diversity, equity, and inclusion in STEM
• Prepare the STEM Workforce for the future

Pathways

<table>
<thead>
<tr>
<th>Pathways</th>
<th>Objectives</th>
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<tr>
<td>Develop and Enrich Strategic Partnerships</td>
<td>Foster STEM Ecosystems that Unite Communities</td>
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<td>Increase Work-Based Learning and Training through Education Employer Partnerships</td>
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<td>Blend Successful Practices from Across the Learning Landscapes</td>
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<td>Engage Students where Disciplines Converge</td>
<td>Advance Innovation and Entrepreneurship Education</td>
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<td>Make Mathematics a Magnet</td>
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<td>Encourage Transdisciplinary Learning</td>
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<td>Build Conceptual Literacy</td>
<td>Promote Digital Literacy and Cyber Safety</td>
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<td>Make Computational Thinking An Integral Element of All Education</td>
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<td>Expand Digital Platforms for Teaching and Learning</td>
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Texas STEM Landscape
STEM Jobs are Growing Fast in Texas

Between 2017 and 2027 in Texas

STEM jobs will grow

- 20% Computing
- 11% Engineering
- 17% Advanced Manufacturing

All other jobs will grow

15%

STEM Earning are Higher in Texas

Median earnings in Texas STEM jobs are:

$38.18 /hour

Median earnings in all other Texas jobs are:

$18.36 /hour
The Gender Gap in Computing

Number of computing degrees/certificates in Texas

- **Men**
  - 2001: 4815
  - 2002: 5700
  - 2003: 6037
  - 2004: 5905
  - 2005: 5421
  - 2006: 4794
  - 2007: 4170
  - 2008: 4160
  - 2009: 4589
  - 2010: 5457
  - 2011: 6570
  - 2012: 6666
  - 2013: 6887
  - 2014: 7176
  - 2015: 8657
  - 2016: 9233
  - 2017: 9665

- **Women**
  - 2001: 2529
  - 2002: 2811
  - 2003: 2820
  - 2004: 2639
  - 2005: 2047
  - 2006: 1579
  - 2007: 1323
  - 2008: 1224
  - 2009: 1292
  - 2010: 1460
  - 2011: 1831
  - 2012: 1908
  - 2013: 2013
  - 2014: 2250
  - 2015: 3033
  - 2016: 3398
  - 2017: 3541
The Gender Gap in Engineering

Number of engineering degrees/certificates in Texas

- **Men**
  - 2001: 4595
  - 2002: 5111
  - 2003: 5669
  - 2004: 5809
  - 2005: 5991
  - 2006: 5704
  - 2007: 6046
  - 2008: 6372
  - 2009: 6742
  - 2010: 7423
  - 2011: 7655
  - 2012: 7981
  - 2013: 8502
  - 2014: 9376
  - 2015: 10923
  - 2016: 12059

- **Women**
  - 2001: 1277
  - 2002: 1333
  - 2003: 1450
  - 2004: 1478
  - 2005: 1572
  - 2006: 1492
  - 2007: 1518
  - 2008: 1563
  - 2009: 1708
  - 2010: 1836
  - 2011: 2004
  - 2012: 1983
  - 2013: 2254
  - 2014: 2623
  - 2015: 3033
  - 2016: 3368

- **Years**: 2001 to 2017
Texas is expected to have the second-highest percentage of the nation’s future STEM job opportunities.
Texas Workforce Commission

Currently in Texas:
- STEM programming exists in pockets
- GT/top performing students
- STEM elective courses

We need to shift our focus to all students in order to fill the STEM demand in Texas.
• More than **60 %** of middle-skill STEM jobs in TX require **six months or less** of formal classroom training.

• STEM Middle-skill job wages are **$35,000-$95,000** per year.

• Demand for middle-skill workers with STEM-related training continues to **increase** and jobs remain vacant.

• Potential earnings for **STEM occupations** are also nearly **double** that of all other jobs in Texas.

• Associate’s degree in STEM earns between **$75,000-$100,000**. Slightly greater than those with a Non-STEM bachelor’s or master’s degrees.

• Employment in STEM jobs will only increase over the next decade—nearly 25 percent—with significant opportunities in **computing, engineering, and advanced manufacturing fields**.
1. Thing that surprised you.
2. Things you felt were important
3. Ways that will influence the way you think about advising young people.
Texas Snapshot: Baseline Date for STEM in Texas

Workforce Need

• 149 STEM occupations with unfilled jobs representing 162,149 annual openings

• 57 of 149 STEM occupations representing 82,874 annual openings are middle skill STEM jobs

• TWC predicts Texas will have 1,914,004 STEM openings in 2026
  (TEA Labor Market Analysis 2019)

STEM Endorsements

• 609,705 students enrolled in 8th grade to earn a STEM Endorsement (data represents 3 years)

• 155,994 of students enrolled in STEM cluster courses (*students double counted)

• 9,161 students completed a STEM Endorsement in 12th grade (data represents 3 years)
609,705 selected STEM Endorsement in 8th Grade

155,994 Enrolled in STEM CTE Courses

9,161 Earned STEM Endorsement

1.9 million STEM Openings predicted in 2026
Region 1
Labor Market Data
Region 1 Education Attainment Snapshot 2020

<table>
<thead>
<tr>
<th>Education Level</th>
<th>% of Population</th>
<th>Population</th>
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</thead>
<tbody>
<tr>
<td>Less Than 9th Grade</td>
<td>24.1%</td>
<td>232,813</td>
</tr>
<tr>
<td>9th Grade to 12th Grade</td>
<td>12.4%</td>
<td>120,072</td>
</tr>
<tr>
<td>High School Diploma</td>
<td>24.6%</td>
<td>238,479</td>
</tr>
<tr>
<td>Some College</td>
<td>16.9%</td>
<td>163,285</td>
</tr>
<tr>
<td>Associate's Degree</td>
<td>5.4%</td>
<td>51,807</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>11.9%</td>
<td>115,177</td>
</tr>
<tr>
<td>Graduate Degree and Higher</td>
<td>4.8%</td>
<td>45,996</td>
</tr>
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</table>
Top Growing Industries

- Health Care and Social Assistance
- Accommodation and Food Services
- Government
- Transportation and Warehousing
- Administrative and Support and Waste Management and Remediation Services
- Educational Services
- Professional, Scientific, and Technical Services
- Wholesale Trade
- Arts, Entertainment, and Recreation
- Other Services (except Public Administration)
- Manufacturing
- Management of Companies and Enterprises
- Information
- Finance and Insurance
- Utilities
Top Industry Earnings

2019 Earnings Per Worker

Utilities
Mining, Quarrying, and Oil and Gas Extraction
Management of Companies and Enterprises
Government
Manufacturing
Professional, Scientific, and Technical Services
Finance and Insurance
Transportation and Warehousing
Wholesale Trade
Information
Real Estate and Rental and Leasing
Educational Services
Construction
Agriculture, Forestry, Fishing and Hunting
Health Care and Social Assistance
Retail Trade
Administrative and Support and Waste Management and Remediation Services
Other Services (except Public Administration)
Arts, Entertainment, and Recreation
Accommodation and Food Services

$0  $20,000  $40,000  $60,000  $80,000
STEM Vision for Texas
STEM Education is...
- A way of thinking about content
- A method of delivering integrated content (approach to learning)
- Real-world problems presented as part of the curriculum and students are challenged to apply content seamlessly
- Teaching STEM fluency skills that are transferrable

STEM Education is not...
- A course or program
- Turning all students into engineers
- A buzz word
- A fad or short-term endeavor
STEM (Science, Technology, Engineering, and Mathematics) education is a method of hands-on teaching and learning where students learn to apply academic content by creatively solving real-world problems with innovative design-based thinking to prepare students for future career opportunities.
STEM Education Goals

- Ensure **equitable** access to STEM programming across Texas

- Increase **student outcomes** and help guide students into relevant, and engaging pathways that prepare students for future careers

- Vertically align efforts to allow **earlier exposure** to STEM integrated thinking
What Texas considers to be the gold standard STEM program

<table>
<thead>
<tr>
<th>Integrated STEM approach in all core content areas (STEM skills, EDP, and CT)</th>
<th>Aligned</th>
<th>Equitable for all students</th>
<th>Promotes STEM fluency skills</th>
<th>Instructional method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>Horizontally aligned (cross curricular)</td>
<td>Gender</td>
<td>Communication, creativity, critical thinking, collaboration, resilience, promptness, adaptability, time management</td>
<td>Project/problem-based learning</td>
</tr>
<tr>
<td>Math</td>
<td>Vertically aligned (PK-20)</td>
<td>Race</td>
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<tr>
<td>Social Studies</td>
<td></td>
<td>Ability Level</td>
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<tr>
<td>Language Arts</td>
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Agenda for Breakout Session

- Texas STEM Framework
- STEM Progression Models and Tool
- STEM Fluency Skills
- Texas STEM EcosySTEM
- Sneak Peak 2020-2021

Friday 11:45-12:30 Texas Education Agency PK-20 STEM Education Update

**New STEM Newsletter goes out next week!!**