Report and Strategic Plan 2013

“STEM education in Nevada supports the alignment of education and workforce development to strategic economic opportunities by ensuring that our students and workforce possess the skills and innovation to succeed in a diversified economy.”

Nevada Governor Brian Sandoval

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Nevada STEM Coalition PO Box 9144 Reno, NV 89507  [www.nvstem.org](http://www.nvstem.org)  775-225-4411  g2nvstem@gmail.com
The Nevada STEM Coalition
managed by Gathering Genius, Inc.

Our Mission
Gathering Genius, Inc. (G² Inc.) is a 501 (c)(3) nonprofit founded in 2006. We formed the Nevada STEM Coalition of partners in 2011. Our mission is to promote leadership and collaboration among business, community, education, and government stakeholders to increase the numbers of capable Nevada high school graduates interested in pursuing STEM jobs, degrees, and careers.

Our Vision
ALL Nevada students are provided the inspiration and opportunity to attain the necessary skills in STEM to be productive in their personal, work, and civic lives. We look forward to the day when Nevada produces the skilled and innovative STEM workforce required to develop an internationally competitive and diversified economy that attracts key industries to our state.

Scientific Literacy is Critical for Careers and Citizenry
Mathematics and science are essential parts of the foundational knowledge that all students need to acquire, and learning in these disciplines enables students to acquire skills and understanding that are increasingly essential to their ability to succeed in high school and in careers. All students need a sophisticated working knowledge of mathematics and science; their schools must not fail them in this.¹

All jobs of the Future Will Require Mathematics and Science!
The most recent ten year employment projections by the U.S. Labor Department show that of the 20 fastest growing occupations projected for 2014, 15 of them require significant mathematics or science preparation to successfully compete for a job.²
Nevada STEM Coalition members from
- Students & parents
- Community
- Business and Industry
- Educators
- Government

Organizational Chart

Gathering Genius, Inc., a 501 (c)(3) nonprofit Board of Directors*
conducting business as

Nevada STEM Coalition

Executive Director

Advisory Committee
Business, education, and community leaders, including from Dream It Do It Nevada

Future staffing dependent upon funding: STEM Specialist, Dir. Of Communications, Website Mgr., Dir. Of Development & Administrative Assistant

Nevada STEM Coalition 2013 Project Committees
(comprised of project managers, G² Board members, NV STEM Coalition members & other volunteers)

Advocacy for STEM Education
Stakeholder Messaging, Marketing & Resources
Educator Resources
Student and Family Resources
Website design, mgmt, updating
Events, Summits, & Special Programs
Guidelines and recognition for exemplary STEM Practices

Advisory Committee

*Board of Directors, listed on page 24, includes representatives statewide from
Business & Industry
Colleges of education
Community Colleges
Community leaders
Dream It Do It Nevada
Expert in diversity in education
Informal education
K-12 public school teachers & administrators
Legal community
Nevada Department of Education
Research and higher education
State legislature
Nevada STEM Coalition Members

Challenger Learning Center of Northern Nevada, Paul McFarlane, Lead Flight Dir.  pualsmcfarlane@sbcglobal.net
Churchill County School District
Clark County School District  Mary Pike, Director of Science, Health, PE, For. Language and Drivers Ed  pikem@interact.ccsd.net
College of Education, UNLV  Dr. William Speer, Dean
College of Education, UNR  Dr. Chris Cheney, Dean
College of Engineering, UNR  Dr. Manos Maragakis, Dean
CURB, Inc., Jeff Sunderman, CEO  jsunderman@sierracapital.net
Dream It Do It, Jonathan Begley, Exec. Director  JBegley@dreamitdoitnevada.com
DRI, Stephen G. Wells, President,  sgwells@dri.edu
DRI Greenpower, Amelia Gulling, Manager, Amelia.gulling@dri.edu
Elko County School District
Exhibit IQ, Inc., John Good, President,  john@exhibitiq.com
iINOVATE22, Joe Elcano,  joee@KNPB.org
FIRST Nevada, South- Jean Hoppert, Director,  gjhoppert@aol.com; North, Dee Freewert  deefrewert@gmail.com
KNPB Channel 5 Public Broadcasting, Joe Elcano,  joee@KNPB.org
Las Vegas Science Festival, Craig Rosen, Director, director@lvscifest.com
Lemelson Education and Assistance Program, Caryn Swobe,  caryn@swobestrategies.com
Lyon County School District
Mendehall Innovation Program, College of Engineering, UNLV, Brendan O’Toole
MESA Northern Nevada
Nevada Arts Council, Maryjane Dorofachuk,  mdoefachuk@nevadaculture.org
Nevada Department of Employment, Training and Rehabilitation, Contact: Frank Woodbeck, Executive Director,  FRWOODBECK@nvdetr.org
Nevada Department of Education
Nevada Environmental Literacy Council, http://www.nvoutdoorkids.org/about  Allison.Brody@unlv.edu
Nevada Outdoor School,
Nevada State Science Teachers Association, Kris Carroll  kcarroll@interact.ccsd.net
Nevada STEM Education Planning Group, Andre DeLeon  adeleon@doe.nv.gov
Northeastern Nevada Regional Professional Development Program
Northern Nevada FIRST Lego League, Dee Freewert, Regional Director, deefrewert@gmail.com
Northern Nevada Regional Professional Development Program, Dave Brancamp, Executive Director
Office of Lieutenant Governor Brian Krolicki
Sierra NV Journeys
Southern Nevada Regional Professional Development Program (SNRPDP)
Space Science for Schools, Inc.
Terry Lee Wells Nevada Discovery Museum
Truckee Meadows Community College, Maria Sheehan, President
Vegas PBS, Lee Solonche, Dir., Educational Media Services, lsolonche@vegaspbs.org
Washoe County School District
Western Nevada College, Dr. Carol Lucey, President,  lucey@wnc.edu
What is STEM Education?

STEM (Science, Technology, Engineering and Mathematics) education focuses on active teaching and learning, centered on relevant experiences, problem-solving, and critical thinking processes.

STEM education emphasizes the natural interconnectedness of science, technology, engineering, mathematics and their connection to other disciplines, to produce informed citizens that possess and apply the necessary understandings to expand Nevada's STEM-capable workforce in order to compete in a global society. Nevada Department of Education

What does that mean?

- Classes are more student-centered. Teachers facilitate more and lecture less. In fact, you may have to look hard to find the teacher!

- Classroom topics may include social studies, science, reading, art, math, technology, and engineering and may include important themes

- Classrooms may be noisy with many groups of students talking, questioning, defending, showing, and doing.

- Students are researching and talking to experts about how the class activities relate to careers or college. They are solving real-world problems.

- Students are reading, writing journals, giving presentations, drawing what they see, collecting and recording data, writing reports, creating graphs and charts. They may be doing art to illustrate what they are learning!

- Students are interpreting, questioning, challenging, drawing conclusions, and applying skills to new situations. Teachers keep asking them to dig down for deeper understanding and explanations. Students are encouraged to question each other. They are preparing for the 21st century workforce that requires teamwork, higher level thinking, and problem solving.

- Students may get their lectures online and do activities in class
• **Drill and practice can be online**, with immediate student feedback and lessons moving as fast as the student learns them

• Students and teachers may be fortunate enough to work in a state-of-the-art laboratory, or, more frequently the case, the teacher may practice “**Walart Science.**” Teachers often buy their own supplies and make do in classrooms that have few resources.

• **The coming new science standards include engineering and technology.** Districts will need to develop new curriculum and provide teachers with professional development (“workforce retraining”) to assist them with content knowledge and teaching practices.

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Good educators have always known that **students often cannot apply what they have learned to new situations.** Students may know information in isolation, but it is a learned skill to apply, or transfer, that knowledge to solving a unique problem or inventing something new. **Researchers and inventors are not always born—they are nurtured from childhood, and often sparked by an outstanding teacher.**

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Exemplary STEM instruction, taught by a talented teacher, requires students to challenge their own assumptions, defend their conclusions, dig deep for answers, work cooperatively, and apply knowledge to solving problems.

It’s also called **INQUIRY LEARNING**

**Isn’t that what we want ALL our kids to be able to do?**
How Does STEM Teaching and Learning Fit with the Common Core and Next Generation Science Standards?

Multidisciplinary STEM practices are required in the Common Core reading and math standards as well as the Next Generation Science Standards. They can include real world career information/experiences as well as other disciplines such as the arts and social studies.

NAEP Testing for 2011, Grade 8 Science (Nationwide)

- “Students doing hands-on projects in class more frequently scored higher”\(^{iii}\)
- “Students who report doing science-related activities that are not for schoolwork score higher”\(^{iv}\)
Why is STEM Education Important for Nevada?

Business leaders in Nevada have sounded an alarm. They 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.

To address this challenge, Nevada is raising the bar. The state has joined 44 others in adopting rigorous math standards for K–12—the Common Core State Standards—and it is working with other states to create robust tests aligned to those standards. These are promising developments, but to succeed amid political and financial challenges, the state has to maintain its resolve.

Nevada needs to ensure that schools and students have opportunities to meet a higher bar. The good news is that students have made real 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, and few eighth graders have teachers with an undergraduate major in math or science.

On the bright side, the number of STEM degrees and certificates awarded in Nevada colleges has grown quickly in the past 10 years. Still, they account for fewer than 10 percent of all degrees and certificates. Hispanic students, who comprise more than a quarter of the college-age population, earn less than a tenth of those STEM credentials.

Business leaders stand ready to work with educators and states to keep widening the pipeline.

CAN NEVADA MEET THE DEMAND FOR STEM SKILLS?

Students have made real academic strides in most states, but no state is on track to getting all students the STEM skills they need to succeed in college and careers. Low-income and minority students lag farthest behind.

Students have improved in math

Since 2003, eighth graders in Nevada have made gains on the National Assessment of Educational Progress (NAEP), also known as “the nation’s report card.” Yet most still have far to go to reach a score of 299, NAEP’s cutoff for “Proficient” performance.

8th Grade NAEP scale scores, 2003 & 2011

<table>
<thead>
<tr>
<th></th>
<th>NAEP Scale Score</th>
<th>Change Since 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003</td>
<td>2011</td>
</tr>
<tr>
<td>All</td>
<td>268</td>
<td>278</td>
</tr>
<tr>
<td>Low Income</td>
<td>254</td>
<td>267</td>
</tr>
<tr>
<td>White</td>
<td>278</td>
<td>292</td>
</tr>
<tr>
<td>Black</td>
<td>248</td>
<td>259</td>
</tr>
<tr>
<td>Hispanic</td>
<td>250</td>
<td>266</td>
</tr>
</tbody>
</table>

Totals may not sum due to rounding errors.

Closing achievement gaps must remain a priority

No state has closed the persistent achievement gaps among racial and ethnic groups.

Percentage of students in Nevada scoring at or above proficient in math and science, 2009 & 2011

<table>
<thead>
<tr>
<th></th>
<th>4th Grade</th>
<th>8th Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>46%</td>
<td>43%</td>
</tr>
<tr>
<td>Percentage of Students at or above proficient in math (2011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>48%</td>
<td>43%</td>
</tr>
<tr>
<td>Percentage of Students at or above proficient in science (2011)</td>
<td>37%</td>
<td>35%</td>
</tr>
</tbody>
</table>

For the complete state report, methodology, and sources, visit changetheequation.org/stem-vital-signs.
VITAL SIGNS

Nevada must plug gaps in the STEM pipeline from high school through college

What percentage of high school students graduate? (2009)

<table>
<thead>
<tr>
<th></th>
<th>Nevada</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56.3%</td>
<td>75.5%</td>
</tr>
</tbody>
</table>

Of students who enter a two-year degree program, what percentage graduate? (2009)

<table>
<thead>
<tr>
<th></th>
<th>Nevada</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>42.7%</td>
<td>29.2%</td>
</tr>
</tbody>
</table>

Of students who enter a four-year degree program, what percentage graduate? (2009)

<table>
<thead>
<tr>
<th></th>
<th>Nevada</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35.8%</td>
<td>55.5%</td>
</tr>
</tbody>
</table>

What percentage of college degrees and certificates are in STEM fields? (2008-09)

<table>
<thead>
<tr>
<th></th>
<th>Nevada</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.8%</td>
<td>10.7%</td>
</tr>
</tbody>
</table>

No student should need remediation

30% of Nevada’s first-time community college students who just graduated from high school need remediation in math, which costs the state $5,983,046 each year.

Women and minorities are too critical a resource to remain untapped

Women and minorities are a very large share of the population but they earn just a small share of STEM degrees and certificates.

Percentage of degrees/certificates conferred in STEM fields in Nevada

<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>31%</td>
<td>32%</td>
</tr>
<tr>
<td>Black</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Percentage of awards conferred

Percentage of college-age population

WILL NEVADA STAND FIRM ON HIGH EXPECTATIONS?

Setting high expectations is a critical step toward raising student performance in STEM.

Nevada is showing a commitment to high expectations

Nevada has joined 44 other states in adopting Common Core State Standards in math. Nevada is also working with other states on common math tests to gauge students’ mastery of those standards.

Common standards and tests in math could be a game changer

Nevada used to set a low bar for students in math, but common standards and tests may change that. In 2009, Nevada’s bar for proficiency on its 4th- and 8th-grade math tests was near where the National Assessment of Educational Progress (NAEP) set the bar for merely “Basic” performance.

As states adopt common tests aligned to the Common Core, they will also have to set a common high passing score or threaten the credibility of the entire common standards enterprise. As the bar goes up, the rate of Nevada students passing the tests may plummet. Nevada leaders will have to stand strong on high expectations, even in the face of pressure to back down.

Of course, even the best standards and tests may fall flat if Nevada does not ensure they are well implemented with supports like strong curriculum, teaching materials and professional development. The state should offer clear and regular public updates on its implementation efforts.

Science is the next frontier for better standards and higher expectations

Twenty-six states, including Nevada, are collaborating on common “Next Generation” content standards in science, which they aim to complete in 2013. If these standards meet a high bar, Nevada should adopt them or standards as rigorous.
ARE STUDENTS EXPOSED TO CHALLENGING AND ENGAGING CONTENT?

Lack of access to such content severely limits young people’s college and career prospects.

Building a strong foundation in science takes time

Time for science in Nevada elementary schools has fallen since 1994.

Hours per week spent on science in grades 1–4, 1994–2008

Students of all backgrounds need access to challenging math and science courses

Nationwide, many minority students lack access to such courses.

Percentage of students in schools that do not offer challenging math and science courses, by race/ethnicity, 2009

High-need schools need to retain excellent teachers

In most states, minority and low-income students are more likely to have inexperienced teachers, indicating high turnover rates.

8th graders whose teachers have 5+ years of experience teaching their subject, 2011

For the complete state report, methodology, and sources, visit ChangetheEquation.org/stem-vital-signs.
DO SCHOOLS AND TEACHERS IN NEVADA HAVE WHAT THEY NEED TO SUCCEED?

Teachers need the tools of their trade

8th graders whose teachers say they have all or most of the resources they need, by income, 2011

All students need access to science facilities and supplies

8th graders whose schools have science labs, by income, 2011

Parent support and engagement are critical to student success

Teachers who say lack of support is a serious problem, 2011

RECOMMENDATIONS

Impatience is a virtue when it takes data and real solutions as its guides. The time to act is now. These Vital Signs provide business, education, state and policy leaders with an extensive and reliable set of indicators to promote STEM learning and high expectations for all students. We’ve crunched the numbers to offer insights into much-needed actions that can be undertaken right away with resolve.

■ Improve teacher preparation and support
Nevada needs more teachers with a strong background in STEM content and pedagogy. Strategies include requiring teachers to demonstrate a stronger grasp of content while broadening the supply of teachers who can clear the higher hurdles. Nevada should create more pathways into teaching for STEM majors in college or STEM professionals who are interested in teaching. The state should also strengthen incentives to attract and retain such teachers for the schools that need them most—often in low-income communities.

Current teachers must receive excellent professional development, especially as new math and science standards take effect. Rather than reporting on the amount of professional development teachers receive, states should measure and report on its quality.

■ Ease the transition between high school and college
Nevada students should understand the requirements for college admission and whether a high school diploma prepares them for college-level work. One way to ensure that diplomas have meaning is to align state high school graduation and college entrance requirements. Nevada should also expand access to rigorous courses in math and science. For example, the state could strengthen initiatives that help schools boost participation in AP courses, especially among women and minorities.

■ Make science count
Nevada tests students in science, but it only holds schools accountable for meeting student performance targets on reading and math tests. Science should count, too. When there are no consequences for science achievement, schools can easily give science short shrift. The time Nevada’s elementary schools devote to science has declined steeply in the past two decades.

For the complete state report, methodology, and sources, visit changetheequation.org/stem-vital-signs.
2012 Nevada Statewide
Inaugural STEM Coalition Summit
Final Report

Executive Summary
In March 2012 Gathering Genius, Inc. hosted the first statewide STEM summit in Las Vegas for 240 participants. The participants represented Nevada stakeholders from education, community, business, and government, as well as out-of-state business and education institutions. Many participants were members of the Nevada STEM Coalition, a loosely knit group of individuals and organizations who support the mission of improving STEM education in Nevada. Each had their own perspectives about the importance of science, technology, engineering, and math (STEM) proficiency among Nevada’s students and teachers. Individual participants attending the summit had some relationships with each other, but the attendees had never had an opportunity like this to assemble and discuss common concerns and goals.

The summit goal was to build a sense of community among key interest groups and begin to mobilize resources and volunteers to create a statewide STEM network and STEM strategic plan in the coming year. A common goal among participants was to articulate the importance of the role that STEM proficiency plays in developing students ready for the workforce, certification programs, and higher education.

The summit was built around seven roundtable topics identified by interest groups from northern and southern Nevada prior to the summit. Each participant attended two roundtables over the course of the summit for in-depth discussions about the barriers and possible solutions to strengthening Nevada’s performance in these areas.

1. Technology Infrastructure and Innovation,
2. Ensuring Diversity in Nevada’s STEM Student Pipeline,
3. EC-12 STEM Standards and Curriculum,
4. Workforce Readiness,
5. STEM Student Pipeline to Higher Education,
6. Informal/Nonformal Education: Opportunities Beyond Conventional Instruction, and
7. Teacher Preparation and Continuing Education.

Some common themes resonated throughout the summit. One of the most important is that STEM must be a central and enduring thread throughout education K-12, not an option. Nevada cannot produce the workforce and student pipeline to college in the careers that are needed now and will be most needed in the future without ensuring that there is more focus on mathematics and science starting in kindergarten. Children, especially girls, are far less likely to pursue STEM courses in high school and beyond unless they develop the interest by about 4th grade. There must be equity in access to STEM across all demographics if we are to produce an adequate number of skilled workers and students pursuing STEM fields and careers.

Another critical theme was that schools cannot do this alone. A strong statewide STEM agenda will require the support and collaboration of community, educators, business and government. In order to marshal the vast and talented resources of our state to support STEM education, we propose to create a Nevada STEM network—a communications and leadership system that ensures that teachers have easier access to research-based STEM curriculum, resources, and volunteers, and that volunteers and outside organizations such as nonprofits and government agencies have more opportunities to become engaged.

Teachers and students need more access to STEM career role models, more field trips to understand how our businesses operate and what skills they need, and internship opportunities to build interest and skills; in sum, a more consistent effort to link the classroom K-12 to careers. Current efforts to provide opportunities for students to access ACT skill testing and pursue credentials post high school need strong support to expand statewide.
We need to provide teachers significantly more professional development in subject matter content as well as in STEM teaching practices. The Common Core Standards in mathematics and literacy have some standards in common with the upcoming science standards—those that develop problem solving, higher order thinking, identifying problems and solutions, and defending conclusions. STEM teaching practices, with their emphasis on hands-on, project-based instruction that develops problem solving and higher order skills, can address these standards across the curriculum.

Finally, there was much agreement that educators need help in raising awareness among community, government, and business stakeholders about their successes as well as their need for support. Many ideas emerged for marketing, better news coverage, highlighting successful schools and career opportunities, and highlighting great role models in our community.

The board of Gathering Genius, Inc. urges all interested stakeholders to support us as we prepare for our next round of workshops early this fall to develop a Nevada STEM Network and marketing plan, support the NDE’s ongoing science standards strategic planning, and finalize ongoing stakeholder work in creating a matrix for exemplary STEM teaching practices and exemplary STEM teacher professional development. We are also excited about a school STEM self assessment tool that will be a product of this upcoming workshop.

Note:


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www.nvstem.org
g2nvstem@gmail.com
Offices: UNR Raggio STEM Research Center, Reno & DRI Southern Nevada Science Center, Las Vegas

From *STEM State-Level Analysis*, Georgetown University Center on Education and the Workforce
(Note: they have since corrected data to say that 8%, not 6% of all MA jobs will be in a STEM field by 2018)

- Nevada will demand a total of 49,460 STEM jobs by 2018, up from 37,220 in 2008.
- 84 percent of these jobs will require postsecondary education and training by 2018.
- STEM jobs will be 3 percent of all jobs in Nevada in 2018.
- This represents a 33 percent increase in STEM jobs, 16 percentage points above the national average.
- 40 percent of STEM jobs in Nevada will be in Computer Occupations by 2018.
- 6 percent of all jobs for Master's degree holders and 12 percent of all jobs for PhD holders in Nevada will be in a STEM field by 2018.

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THE MAJORITY OF STEM JOBS IN NEVADA WILL REQUIRE POSTSECONDARY EDUCATION OR TRAINING BY 2018

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Number of Jobs</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school or less</td>
<td>7,650</td>
<td>15%</td>
</tr>
<tr>
<td>Some College/No Degree</td>
<td>11,180</td>
<td>23%</td>
</tr>
<tr>
<td>Associate's degrees</td>
<td>5,160</td>
<td>10%</td>
</tr>
<tr>
<td>Bachelor's degrees</td>
<td>18,130</td>
<td>37%</td>
</tr>
<tr>
<td>Master's degrees</td>
<td>6,400</td>
<td>13%</td>
</tr>
<tr>
<td>Doctoral degrees</td>
<td>940</td>
<td>2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>49,460</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*Totals may differ slightly due to rounding

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**Occupational Distribution of STEM Jobs through 2018**

<table>
<thead>
<tr>
<th>Occupation Type</th>
<th>Number of Jobs</th>
<th>% of all STEM Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Occupations</td>
<td>19,740</td>
<td>40%</td>
</tr>
<tr>
<td>Engineers &amp; Engineering Technicians</td>
<td>15,350</td>
<td>31%</td>
</tr>
<tr>
<td>Life &amp; Physical Science Occupations</td>
<td>7,510</td>
<td>15%</td>
</tr>
<tr>
<td>Architects, Surveyors &amp; Technicians</td>
<td>5,820</td>
<td>12%</td>
</tr>
<tr>
<td>Mathematical Science Occupations</td>
<td>1,040</td>
<td>2%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>49,460</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*Computer Technicians, Programmers, and Scientists
**Totals may differ slightly due to rounding

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**Percent of Nevada's jobs that will be in STEM, by educational attainment**

<table>
<thead>
<tr>
<th>Educational Attainment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school or less</td>
<td>1%</td>
</tr>
<tr>
<td>Some college/No degree</td>
<td>4%</td>
</tr>
<tr>
<td>Associate's degrees</td>
<td>3%</td>
</tr>
<tr>
<td>Bachelor's degrees</td>
<td>7%</td>
</tr>
<tr>
<td>Master's degrees</td>
<td>6%</td>
</tr>
<tr>
<td>Doctoral degrees</td>
<td>12%</td>
</tr>
</tbody>
</table>
Industry Needs STEM Skills

Core Competencies for the Manufacturing Industry

Similar models exist for other industries such as agriculture, mining, energy, etc. The bottom three tiers of requirements are universal across all employment sectors.

The Manufacturing Institute and the U.S. Department of Labor (2012)
EVERY TARGETED INDUSTRY REQUIRES WORKERS WITH STEM SKILLS!
Why is STEM Education so Important for our Nation?

- STEM skills are in high demand across the workforce, not just STEM-related jobs

Higher level thinking skills
Teamwork
Problem solving
Innovative solutions
Communication skills

- “At all levels of educational attainment, STEM job holders earn 11 percent higher wages compared with their same-degree counterparts in other jobs.”

- America’s global competitiveness will increasingly depend on our ability to better educate our young people in math and science and to attract more of our best and brightest students into technological careers

- “Over the past 10 years, STEM jobs grew three times faster than non-STEM jobs. STEM jobs are expected to grow by 17 percent during the 2008-2018 period versus 9.8 percent growth for non-STEM jobs.”
• Manufacturing companies report workforce shortages:
  63% in Aerospace and Defense,
  45% in Energy, and
  63% in Life Sciences.\(^\text{xii}\)

• “Rather convincing empirical evidence suggests that most children who are ‘turned off’ by mathematics and science have already arrived at that conclusion by the time they are in 4\(^\text{th}\) grade. The die is usually cast by a teacher who finds teaching science and mathematics an unwelcome and intimidating burden or by a parent with a disinterest or disdain for these fields.” \(^\text{xii}\)

• “The average annual wage for all STEM occupations was $77,880 in May 2009, significantly above the U.S. average of $43,460 for non-STEM occupations.” \(^\text{xiii}\)

• “In 2010, the unemployment rate for STEM workers was 5.3 percent; for all other occupations, it was 10 percent.” \(^\text{xiv}\)

• “…many classrooms are staffed by teachers with neither a certificate nor a degree in their assigned subject area. High content knowledge by teachers is a prerequisite to high student performance.” \(^\text{xv}\)
• “A student’s ability to enter and complete a STEM postsecondary degree or credential is often jeopardized because the pupil did not take sufficiently challenging courses in high school or spend enough time practicing STEM skills in hands-on activities.”\textsuperscript{xvi}

• “Ninety-three percent of US public school students in fifth through eighth grades are taught the physical sciences by a teacher without a degree or certificate in the physical sciences.”\textsuperscript{xvii}

• 50% of our current science and engineering workforce is approaching retirement\textsuperscript{xviii}

• “The National Academies \textit{Gathering Storm} committee concluded that a primary driver of the future economy and concomitant creation of jobs will be \textit{innovation}, largely derived from advances in science and engineering. While only four percent of the nation’s workforce is composed of scientists and engineers, this group disproportionately creates jobs for the other 96 percent.”\textsuperscript{xix}
What Do Leading Nevada Science and STEM Educators Identify as Key Needs?

- Adoption of new science standards on schedule (our current science standards rated a “D” with the Thomas B. Fordham Institute)
- Adequate time for ALL K-8 students to learn science and experience STEM practices throughout the curriculum
- Stronger content knowledge requirements in science and math for K-8 teaching licensure
- Identification and alignment of exemplary, research-based STEM teaching practices and curriculum
- Increased research-based teacher professional development for Common Core and new science standards
- Sustainability of promising grant-funded programs
- More teacher resources for teaching STEM
- More recognition of Nevada’s many “islands of excellence” in STEM education
How Can I Help?

LEARN MORE


GIVE

- SPONSOR ONE OF OUR 2013 STEM COALITION GOALS (pp. 16-19).
- Donate supplies to science and math teachers.
- Ask your company to consider adopting a STEM school or initiative in your district.
- Support one of your local in or after-school competitive STEM programs such as Legos, FIRST robotics, Science Olympiad, Future Cities Engineering and science fairs. These are powerful ways to build creative, competitive youth for our future.

VOLUNTEER- contact us at g2nvstem@gmail.com

- Join a Committee!
- Volunteer in a local STEM classroom or help to find materials to teach.
- Advise a teacher as an expert in the fields of science, technology, engineering or mathematics
- Share your enthusiasm about your STEM career with students!
- Mentor students with their projects as a STEM expert.

ADVOCATE

- Tell your state representatives how important you feel it is to fund education in general and STEM in particular, as the vast majority of all jobs of the future will require STEM skills. Go to http://leg.state.nv.us and click on “Who’s My Legislator?”

- Talk to your school district about the importance of (1) motivating students about science and math starting in elementary school, (2) providing teachers with the material resources they need to teach and adequate research-based professional development, and (3) ensuring that new STEM schools are supported AFTER the federal seed dollars are gone!
Who We Are

Status and Mission
Gathering Genius, Inc. (G² Inc.) is a 501 (c)(3) nonprofit founded in 2006. Our mission is to promote leadership and collaboration among business, community, education, and government stakeholders to increase the numbers of capable Nevada high school graduates interested in pursuing STEM jobs, degrees, and careers.

Our Vision
ALL Nevada students are provided the inspiration and opportunity to attain the necessary skills in STEM to be productive in their personal, work, and civic lives. We look forward to the day when Nevada produces the skilled and innovative STEM workforce required to develop an internationally competitive and diversified economy that attracts key industries to our state.

G² Inc. Accomplishments
G² Inc. raised over $1 million and hosted the 2009 Intel International Science and Engineering Fair in Reno. Some of the brightest high school students from over 55 countries competed for over $1.5 million in scholarships. Many participants said that it was one of the best-run fairs in 20 years.

G² Inc. met with interest groups in 2010 and formed the Nevada STEM Coalition of individuals, organizations, districts, and businesses that have a stake in increasing the numbers of capable students interested in STEM jobs, degrees, and careers. In 2011 we established a website of resources, www.nvstem.org, expanded our Coalition, and increased the conversation about STEM education in the state.

Thanks to our generous sponsors, G² Inc. raised $100,000 and hosted the first annual Nevada STEM Summit in Las Vegas in March 2012. This was the first time that many STEM educators across the state had had a chance to meet and talk about the challenges surrounding science, technology, engineering and mathematics education in the state. We disseminated a final report that discusses in detail what teachers, supervisors, businesspeople, legislators, and community members see as challenges and needs for STEM education in Nevada and what recommendations they have for implementing reform.


After the summit G² Inc. raised $25,000 in sponsorships and hosted two days of workshops with Nevada STEM Coalition members to generate the outline of a strategic plan for the next 12 months, based on the results of the summit. Results of the 2012 STEM Summit guided our target goals. G² Inc. and the STEM Coalition members will implement this plan using G² Inc. as a fiscal agent, driver, promoter, and advocate to the community and government.
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Nevada STEM Coalition Foundational Principles
(developed by the Nevada STEM Coalition at the Summit Design Workshop November 2011)

1. Ensure that STEM education is foundational for every Nevada student K-12, including the underrepresented and minorities.

2. Meet the needs of Nevada’s employers in all sectors by providing a STEM-literate workforce.

3. Create and support a statewide STEM resource network to enhance collaboration among K-12, higher education, business and industry, government, community organizations, parents, and students.

4. Provide students with opportunities to apply STEM knowledge in the real world to foster creativity, critical thinking, collaboration, problem-solving, and entrepreneurship.

5. Educate policymakers on systemic reforms that can bolster/support quality STEM education practices.

6. Increase the pool of teachers skilled in science, technology, engineering and mathematics and who use research-based best practices in their classrooms.

7. Promote transdisciplinary instruction, where teachers engage students in activities that use multiple disciplines to increase student learning, interest and engagement.

8. Expand students’ access to rich and diverse experiences, starting in early childhood, that increase the numbers of students skilled and interested in pursuing STEM jobs, degrees, and careers.
Nevada STEM Coalition 2013 Goals and Objectives

Goal One: Approve an organizational structure that fully integrates G2 inc. and the Nevada STEM Coalition in order to build statewide partnerships, strength in numbers for advocacy for STEM education, and increased funding through collaborations to meet our mission and goals. The board will develop a long-term strategic plan and seek seed funding for the initiative.

Timeline: G² Inc. will approve and submit an organizational plan to the Nevada STEM Coalition members by January 31, 2013. The long-term strategic plan will be developed and approved by Coalition members by September 1, 2013.

Objectives
- Implement a membership plan for the Coalition
- Approve an organization chart
- Plan for salaried positions for G² of executive director, secretary, web maintenance, and additional consultants for marketing, project management, and web design
- Create a STEM Coalition Planning Committee of stakeholders to participate in coalition strategic planning
- Hold a Five Year Strategic Planning Retreat with the G² Board and STEM Coalition Planning Committee

Goal Two: Increase student access to and involvement in informal education opportunities supporting the classroom by raising awareness among teachers, the community, and business community about the opportunities.

Timeline: this is a proposed four-year project.

Objectives
- Develop a virtual library “big picture” of available informal STEM resources on the nvstem.org website for release in 2014
- Complete database of specific informal resources searchable by teachers, students, parents, and other community members
- Develop and implement an In-service course for teachers: A one credit, online class on finding available statewide informal STEM education resources and generating ideas for their classroom use (In year 2, develop a second one-credit online class on developing one or more classroom activities using informal STEM education resources which are then shared with other educators.)
Goal Three: Create and manage phase one of a communications system (including a website) that (1) provides STEM resources for teachers, students, business, and community; (2) supports meetings and collaborations to scale up and align exemplary curriculum; (3) shares and recognizes exemplary, research-based professional development and classroom practices; (4) recruits STEM experts and volunteers and connects them to teachers and students; (5) raises friends and funds, (6) raises awareness and support from the community and state government; and (6) increases student access to STEM career information and engagement with business.

Timeline: This project will require a combination of volunteer work and funding for revision of the nvstem.org website. Timeline for completion of phase one is December 2013.

Objectives
- Create a STEM Experts Advisory Committee and recruit STEM professionals to serve as education mentors, speakers, content advisors
- Set up and market a website matchmaking system for teachers and community volunteers, STEM experts, outreach programs, etc.
- Contact database of STEM coordinators and leaders willing to serve as resources to colleagues
- Expand website resources such as grant opportunities, links to other NV websites, national STEM websites, curriculum, grant writing webinars for teachers, guidelines and examples of exemplary STEM professional development and classroom practice
- Communications plan that provides opportunities for educators to share programs and collaborate on projects and funding opportunities
- Teacher, parent and student resources for career information, community events, informal STEM programs and competitions
- Parents will be directed to homework help resources. We will ask districts and schools to provide a link to the Coalition website to funnel parents to the resources they need—thereby allowing them to become curious and become familiar with STEM.

Goal Four: Develop and implement a messaging/marketing campaign to increase support for STEM education, research-based teaching practices, and changes to education that are long overdue.

Timeline: Campaign will be rolled out over multiple years depending upon funding and in kind advertising support.

Objectives
- Create a statewide media-based TV/radio campaign aimed at teachers, parents, students, and the public
Goal Five: Identify and disseminate research-based models for teacher professional development (workforce retraining) and classroom/nonformal STEM teaching practices, and establish a recognition system for exemplary professional development, teachers, programs, and schools that are reaching all populations.

Timeline: First draft to members by May 2013, final draft completed and disseminated before end of 2013.

Objectives

- Continue and finalize committee work on guidelines for exemplary teacher professional development and gain consensus from STEM Coalition members
- Continue and finalize committee work on guidelines for exemplary, research-based classroom STEM practices in inquiry, problem-based learning, and real-world applications
- Develop a recognition system for exemplary practices and advertise these statewide

Goal Six: Increase our membership and collaboration with stakeholders to promote statewide alignment of exemplary curriculum development for STEM and to promote increased state and community support.

Objectives

- Continue to recruit new STEM Coalition members through personal contacts; newsletter; and presentations to community groups, districts, schools, and nonformal/informal STEM education organizations
- Collaborate with STEM leaders to increase support for statewide alignment of curriculum and resources to implement the curriculum
Nevada STEM Coalition Long-Term Goals
(to be developed into our Five-Ten Year Strategic Plan)

1. Continue to increase the numbers of students aware of and interested in STEM careers through more STEM mentors and speakers, professional development for teachers in subject content and careers, and more real-world problem-based inquiry in school. Could include something like South Dakota’s My Life program required for all 8th graders

2. Continue to build and expand use of our STEM Communications system

3. Develop a plan to raise awareness for the engineering and technology standards in the new science standards and promote aligned curriculum development and teacher professional development

4. Support the Nevada Commission on Educational Technology strategic plans, including the Nevada 1:1 Plan

5. Promote and assist the full alignment and integration of STEM curriculum P-16 across Nevada

6. Increase collaboration among districts and higher education to increase research and/or scale up exemplary STEM programs in order to win more grant dollars

7. Expand the numbers of STEM schools that demonstrate increased student achievement as a result of better trained teachers in their content fields and in updated teaching practices that develop more students with skills in problem solving, higher level thinking, team work, and collaboration

8. Increase the numbers of students exiting high school interested in and prepared for STEM coursework and degrees as well as certificate programs and the workforce

9. Increase college retention rate in STEM fields by increasing and maintaining support for underrepresented college students

10. Increase public awareness of how STEM education is directly tied to producing students ready for college and the workforce in order to increase public engagement and support.

11. Increase planning in districts to support new STEM initiatives long term

12. Increase state funding of STEM professional development, teacher resources for problem-based learning, and SUSTAINABILITY of new programs seeded by federal agencies

13. Increase in access to STEM K-12 for underrepresented populations and rural districts

14. Measurable reduction of unfilled STEM jobs in Nevada and increased interest from industry to move to Nevada

15. Develop an advocacy plan for the 2015 legislative session
References


Endnotes


IV Ibid.


Ibid.

Ibid., p. 5

Ibid., p. 5

