



# Science Education and Local Control

**Will California's new system of Local Control lead to needed improvements in science and STEM education?**

## OVERVIEW

This policy brief reviews the Local Control and Accountability Plans (LCAPs) created by school districts during the first year of California's new system of increased local control over school financing. The brief looks at how Science, Technology, Engineering and Math (STEM) education fared in district plans, and especially how districts planned to fulfill the state requirement to implement our new state-adopted science standards — the Next Generation Science Standards (NGSS). While the findings were disappointing — **only 43% of the districts whose plans we examined made explicit reference to the California**

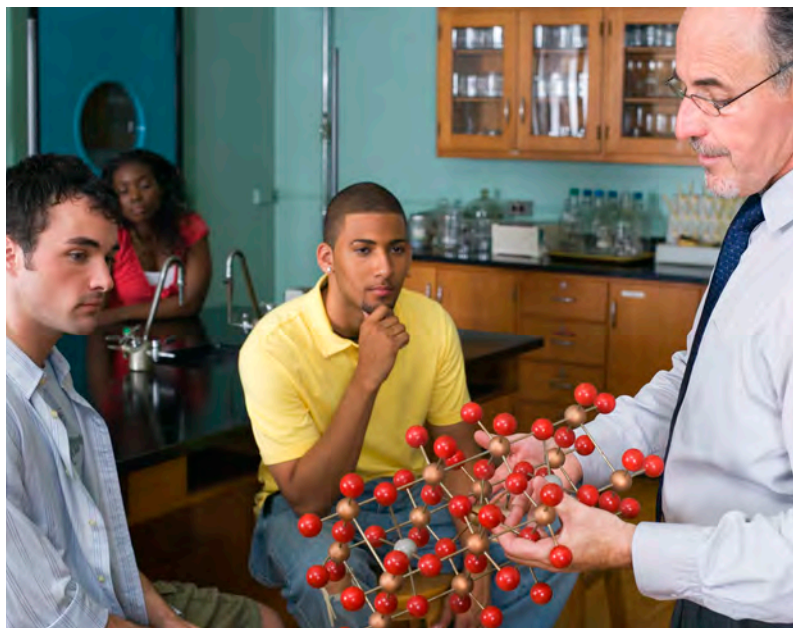
**NGSS; and fewer than 30% included professional development specifically identified to help teachers deliver these new science standards** — they do help point the way to the steps that districts should be taking to update and improve these plans which will guide the vast majority of California's education spending going forward. The brief offers recommendations for all who care about STEM education — educators, parents, students, business and community leaders — to advocate for strengthening support for science education in the next round of LCAPs and beyond.

## Introduction

For a few years now, the outcry has been growing about the need to improve STEM education in California and nationally. **A recent USC-Los Angeles Times poll found that nearly half of respondents identified increasing funding for STEM education as a top priority.**<sup>1</sup> Californians understand that STEM fields drive our innovation economy. In fact, STEM jobs in California are projected to grow 22 percent by 2020 — to well over one million new jobs<sup>2</sup> — and seven of the nation's ten fastest-growing occupations are in STEM fields.<sup>3</sup>

Yet, California students' math and science achievement trails that of students in most other U.S. states — ranking 41st in math and 46th in science on the most recent National Assessment of Educational Progress.<sup>4</sup> Similarly, California students

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lag behind their peers in other countries, measuring below the international average on the benchmark international test of math and science.<sup>5</sup> Moreover, as a result of federal and state accountability policies that have been intensely focused on reading and math, science education has been neglected in many California schools and classrooms over the past decade, especially in elementary schools.

**In California's new era of increased local control of education decision-making, the PRIMARY WAY TO STRENGTHEN STEM EDUCATION AND REVERSE THESE TROUBLING TRENDS IS THROUGH THE FOCUSED ACTIONS OF LOCAL EDUCATION LEADERS, guided by input from students, parents, business and other community stakeholders.**

High quality STEM education encompasses both rigorous instruction in the individual disciplines of science, technology, engineering and mathematics, as well as integrated approaches that weave one or more of these subjects together — like they are in the real-world practice of science and engineering. While STEM education can equip students with sought-after technical skills and prepare them for high-demand careers in engineering and computer science fields, its purpose in K-12 schools is more fundamental. It is about providing every student opportunity to become scientifically literate through access to an educational experience that ensures they learn the foundational concepts and modes of thinking in these fields that are essential for daily life and citizenry in the 21st century.

Historically, STEM subjects have been taught in most K-12 classrooms by focusing on memorizing abstract formulas and making little connection across subject areas or to real world issues and problems — leaving many students unengaged and uninspired. These problems have been even more prevalent in the schools that serve our most disadvantaged students, since these schools are more likely to experience challenges such as shortages of highly qualified math and science teachers, outdated science lab facilities and few or no advanced placement courses. As a result, these students are graduating even further behind their more affluent peers, and less likely to be able to access higher education and the more technologically advanced and higher-paying job opportunities that exist in both traditional and new growth industries.

**In California's new era of increased local control of education decision-making, the primary way to strengthen STEM education and reverse these troubling trends is through the focused actions of local education leaders, guided by input from students, parents, business and other community stakeholders.** School district leaders now have more authority to direct how they will spend their state education dollars, including funds provided to better serve the highest need students.

## **New State Standards Hold Extraordinary Promise for STEM**

**The biggest opportunity to truly change STEM learning for all students lies in the successful implementation of the state's new math and science standards.**

California's new educational standards — the Common Core State Standards (CCSS) for math and English language arts (ELA), and the Next Generation Science Standards (NGSS), are designed to make learning more engaging and more rigorous for all students. These new standards fundamentally revise teaching and learning to focus on deepening students' conceptual understanding, critical thinking, and communication skills.

Adopted by the state in 2010, implementation of the CCSS is now fully underway in all schools statewide. The NGSS were adopted in September 2013 and schools

have the next three years to prepare for full implementation by the fall of 2018. These new science standards present an exciting opportunity to fundamentally change and improve science education at every grade level. California's state science standards had not been updated since 1998. With the NGSS, for the first time, engineering design is fully integrated with science education and the new standards are aligned to the state's new math and ELA standards at each grade. More importantly, the three-dimensional design of the NGSS (see Figure 1) will ensure students obtain a firm grounding in the most important core disciplinary ideas while also learning the cross-cutting concepts and

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science and engineering practices that are essential for scientific literacy, thinking and problem-solving.

At the same time, these changes present a daunting challenge to many teachers and administrators who will need time and support to become familiar with the new standards, learn new pedagogical techniques and

### Science and Engineering Practices

NGSS integrates **eight major practices** scientists and engineers use to investigate and understand our world, and to build theories and solutions:

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

### Crosscutting Concepts

NGSS identifies **seven conceptual connections across disciplines**, and uses them to deepen students' overall scientific literacy:

1. Patterns
2. Cause and Effect
3. Scale, Proportion, and Quantity
4. Systems and System Models
5. Energy and Matter in Systems
6. Structure and Function
7. Stability and Change of Systems

## Three Dimensions of the Next Generation Science Standards

### Disciplinary Core Ideas

NGSS emphasizes **deep understanding of the core ideas of science**, with progressive complexity across school years:

- \* Physical Sciences
- \* Life Sciences
- \* Earth and Space Sciences
- \* Engineering, Technology and Applications of Science

For further information about the development of the Next Generation Science Standards, visit the NGSS website at [www.nextgenscience.org](http://www.nextgenscience.org).



innovative teaching strategies (e.g., project-based learning, the engineering design process), and be prepared to administer new exams that are anticipated in Spring 2019 (with prior year field testing). For these supports to be provided, they must be included within local district plans, as explained above.

## New Local Control Accountability Plans Drive District Investment

In 2013, California adopted a major change in how schools are funded and held accountable with the creation of the Local Control Funding Formula (LCFF). It was designed to allocate funding more simply, rationally and equitably, providing base funding for each student and allocating supplemental funding for each low-income, English learner, and foster youth student — children who need additional support to succeed. At the same time, many categorical funds previously allocated to districts to spend on specific programs were abolished. This means that districts will receive more money with fewer strings attached — at full implementation, **LCFF will provide districts with billions of dollars in additional funding to serve high-need students than was targeted to them prior to LCFF. It also means that the bulk of the cost of implementing the new state standards must be paid for by LCFF funds.**

The state did allocate one-time funding of \$1.25 billion in FY13-14, and another \$3.5 billion is proposed for FY16 to jump-start implementation of the CCSS and NGSS. But these funds are meant only to help cover the short-term transition costs of moving to a new system — expenses such as training to introduce teachers to the new standards, purchasing technology and instructional materials. The ongoing costs of delivering core instruction in new ways must be embedded in each district's core budget and program plan.

Fortunately, the LCFF also included a new tool for districts to develop their program priorities and budget plan — the **Local Control and Accountability Plan (LCAP)**. The LCAP brings together for the first time planning, budgeting, and accountability into a single, coherent

The LCAP brings together for the first time **PLANNING, BUDGETING, AND ACCOUNTABILITY INTO A SINGLE, COHERENT PROCESS**, and requires deeper engagement of parents, students and other community stakeholders in the district's process.

process, and requires deeper engagement of parents, students and other community stakeholders in the district's process. State law requires that each LCAP must:

- \* Provide a three-year roadmap of the district's goals, strategies and related funding allocations.
- \* Demonstrate how the plan will improve student achievement, including ensuring that intended funding is directed to serve high-need students effectively.
- \* Report annually on progress toward meeting the goals of the plan and annually update the plan in light of that progress and changing student needs.

Most importantly for science and math, state law requires that every LCAP address a set of eight specific state priorities. **Priority #2 — Implementation of State Standards**, makes the most direct reference to the NGSS. State law defines Priority #2 as: *"implementation of academic content and performance standards and English language development standards adopted by the state board for all pupils, including English learners,"* and references state education code that lists all State Board of Education approved standards, including the NGSS. Many districts and policy-makers have inaccurately interpreted this priority to be about implementation of the CCSS only. While NGSS implementation activities will not be as extensive as CCSS at this stage, the law is clear that districts must address the new science standards as part of their LCAPs. In addition, goals and services to address critical needs in science education should be included under other priorities, such as Priority #1 (which addresses students having appropriately assigned and credentialed teachers), Priority #4 (which focuses on pupil achievement through performance on standardized tests and other indicators of college and career readiness), and Priority #7 (which requires students to be enrolled in a broad course of study).

## Examining Science Education in the First Year of Local Control

LCAPs will fundamentally drive how education funds are spent to meet district priorities and improve student outcomes. Therefore, CSLNet wanted to know how districts are using their LCAPs to direct investment in implementation of the new state standards under Priority #2 or elsewhere in their plans. Knowing that there would be significant attention paid to the CCSS by other researchers, we decided to focus on how districts were addressing implementation of the NGSS. We also were curious to understand what districts were doing to support other aspects of STEM learning.

### Data Findings

Our study, conducted in the summer of 2014, looked at LCAPs developed for the first year of LCFF implementation. We examined the LCAPs of 88 districts

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representing the 50 largest districts in the state along with the largest district in each county, together serving some 2.5 million students in total (see Research Methodology on page 12). Our research focused on where and how the NGSS and science education were referenced in each LCAP.

The overall findings of our research were disappointing:

- \* Only 43% of districts referred to NGSS in any way.
- \* Less than 1 in 3, or 28%, of districts addressed professional preparation of teachers to deliver NGSS.
- \* And even when we included self-described STEM programming as well as NGSS, only 54% of districts provided funding allocations distinctly for these areas.

Additional findings:

- \* The most common reference to NGSS was a simple acknowledgment that the new standards would need to be implemented in future years.
- \* Many districts that did reference NGSS integrated it with CCSS implementation efforts, and described both activities and funding collectively for the two sets of standards.
- \* A small number of districts demonstrated focused approaches to NGSS programming that differentiated NGSS implementation plans and budgeting, and described specific activities to achieve their goals. Among these references were:

- Setting forth multi-year plans for staged implementation of the standards.
- Professional development activities to support effective teaching of NGSS such as:
  - ◆ Training content resource teachers to develop curriculum for each science discipline.
  - ◆ Hiring instructional coaches.
  - ◆ Providing all teachers an understanding of how NGSS differs from prior standards.
- Integrating NGSS in blended learning environments to narrow achievement gaps.



\* A few districts set forth clear expenditure plans for specific science-related activities, including distinct levels of funding for:

- Personnel, such as science coordinators.
- Expanding programs such as Project Lead the Way or science enrichment programs.
- Investments in technology and training for its use in support of NGSS.

The information provided by surveyed districts varied dramatically and followed few discernable patterns. Data entries ranged from those that specified detailed activities and funding allocations, to those that did not reference NGSS at all. While we saw some promising approaches in certain districts, the aggregate results indicate grossly insufficient attention given to NGSS in the first round of LCAPs. If this practice is not corrected, schools will miss an important opportunity to reduce the huge equity gaps that exist between populations of students in relation to both participation and success in STEM.

In sharing these and other findings, we recognize these LCAP plans were the very first ones that districts ever created and their efforts were impacted by some significant limitations; not surprising for a new reform that was still being structured by the state even as districts were required to proceed. Districts were required to use new processes, under a very short timeline, and with some confusion in the field regarding what was required to be included in the documents. As a result, it is likely that these first year LCAP documents do not capture all the important activities districts are doing in science and other priority areas.

Notwithstanding those challenges, these first LCAPs do reflect districts' initial expression of their program and funding priorities — for all children and for serving high-needs students — and how they will make progress toward those priorities. **As such, our analysis raises several concerns given the limited attention that districts appear to be giving to NGSS implementation:**

## Science is Not Yet a Policy Priority for Every District and Student

More than half of surveyed districts made no mention of NGSS programming or funding in any aspect of their three-year plans, and most that referenced the standards lacked detail. Given the amount of money and breadth of priorities that are included in LCAPs, anything left out can face an uphill climb in gaining integration into future district operations.

- \* Planned expenditures for NGSS often were incorporated within broader goals or objectives, such as millions of dollars allocated to “implementing standards” or “increasing course access.” Few details of “implementation” — such as staffing activities or instructional materials — were provided. On the other hand, targeted funding allocations were more prevalent when a district specified NGSS as a policy priority.
- \* Few districts took advantage of the three-year planning trajectory of LCAPs, and the enhanced predictability of funding that LCFF brings, to do thoughtful planning to ramp up NGSS over multiple years. Even among the districts that specified clear activities and funding, it was common to cite the same level of expenditure for all three years, not recognizing potential differences of amount or purpose within a staged implementation.



## STEM PROGRAMMING IN LCAPS

Although not required to be included in LCAPs, CSLNet was interested to see how many districts explicitly identified STEM programming in their plans.

Our research found that 41% of districts included some reference to STEM in their LCAPs. The range of those references was as follows:

- \* Most references to STEM were non-specific, including:
  - Planning to “expand STEM opportunities for students.”
  - Including STEM within the goal of “providing 21st century skills to students.”
  - Planning to “have STEM programs at all sites.”
- \* A few plans described a specific STEM program (e.g., STEM summer programming for low-income students), accompanied by staged roll-out plans and dedicated investments over three years.
- \* Small numbers of districts referenced distinct STEM-related activities (see table below). The most frequently cited programs were:
  - Providing career-technical coursework in STEM subjects.
  - Expanded learning opportunities (e.g., after-school and summer programs) in STEM.

These findings are both promising and concerning. The fact that more than 40% of districts included STEM through a wide variety of program strategies is a promising indicator that interest and support for STEM is growing across the state. However, many LCAP entries that referenced STEM focused on narrow areas of programming (e.g., a robotics course) or supplementary areas that do not serve all students. Effective STEM learning should be an integral part of every student’s core educational experience; yet, our findings indicate that many districts are approaching STEM learning opportunities as an “add-on.” Integration of STEM content into such programs as expanded learning, career-technical education and career pathways is a good indicator that districts are promoting the incorporation of stronger academic content into these areas. However, we did not see much evidence that districts are focused on STEM as a core feature of instruction for all students.

STEM ACTIVITY	INCLUDED IN LCAP
Career Technical Education (CTE) Coursework in STEM Subjects	8 districts (9.1%)
Expanded Learning Opportunities in STEM	8 (9.1%)
Career Pathway Programs	4 (4.5%)
Programs that Involve Business/Community Partners	3 (3.3%)
Advanced Placement Courses in STEM Subject	2 (2.3%)
Focus on Strengthening Math and Science in Elementary or Middle Schools	2 (2.3%)
Single Issue (e.g., Robotics) Units or Clubs	2 (2.3%)

## Districts Not Yet Investing in Critical Early NGSS Teacher Professional Learning

Nothing is more critical to the success of NGSS than preparing teachers to be effective in understanding and delivering instruction consistent with the new standards. Just as the new standards focus on students learning differently, NGSS will demand major pedagogical shifts if educators are to be able to engage students in new ways and convey this more rigorous educational content. Thus, every district will need to plan for and invest in the professional development of its teaching force; yet 72% of districts did not specify this activity in their initial three-year plans.

## Districts Do Not Understand Changes in State Requirements and Flexibility for Standards Implementation

Some deficiencies of reporting on NGSS activities and funding may be attributed to confusing communications from the state. LCFF laws and regulations apply to NGSS, yet many districts were unclear about whether LCAP reporting on “standards implementation” was supposed to include the NGSS as well as CCSS.

- \* Several districts erroneously cited a “need” for instructional materials to be adopted before they could implement NGSS-based teaching. Unlike with past instructional reforms, districts do not need to wait for the state to adopt curriculum frameworks or instructional materials to implement new science instruction. Because the standards were developed by a multi-state consortia, open-sourced materials from early implementers in other states and districts



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may be available to help districts as they begin transitioning their science instruction. In fact, a consortium of 10 “early implementer” districts in California is already leading the way to begin NGSS instruction well before the state mandated deadline of fall 2018.

## Funding Allocations Not Clearly Linked to Science Programming and Equity Goals

The broad language used in many LCAPs made it difficult, if not impossible, to determine what specific goals and activities were being proposed for science education, what the funding allocations were, or whether they would be sufficient to achieve their instructional or equity goals effectively.

- \* Many districts integrated NGSS implementation activities and/or funding with CCSS activity and funding (e.g., purchasing “standards-aligned” instructional materials). Additionally, some districts listed the same activity and/or allocation for multiple goals, which overinflates the potential impact for each goal. These approaches made it impossible to determine how much attention science, or math (versus English language arts), would receive in a district’s overall planned activities.
- \* Across the board, too little information was provided to demonstrate how planned expenditures would promote equity. Despite the objectives of LCFF, it usually was unclear whether science opportunities would reach high-need student groups, or even reach a particular school.
- \* Few districts provided funding baselines that would allow the reader to determine whether planned expenditures described new programs, program growth or status quo.



## Take Action: Local Stakeholders

The first year of LCAP development should be seen as highly instructive for improving planning and budgeting to support science and STEM learning. The state has already made adjustments to the LCAP template for 2015–16 that will help districts present more clearly how their goals are tied to specific expenditures and how services will reach targeted students and schools. But districts still have wide discretion about how much of their activities they describe in the LCAP and to what level of detail. **It is therefore critical for all concerned stakeholders, from educators, parents and students to local business and community leaders, to be involved in the process of developing the next LCAP for your community and to advocate for your district to have a clear and sufficiently well-funded plan to begin implementation of the NGSS.**

Every district must complete its LCAP with approval from the local school board by July 1st. In addition to school board hearings, school officials must hold public meetings to seek input to the LCAP from community members. Local stakeholders should request a copy of the latest public draft of their district's LCAP to review how plans for NGSS implementation are, or aren't, included, then request meetings with district superintendents and school board members to put forward the following recommendations:

...advocate for your district to have a **clear and sufficiently well-funded plan** to begin implementation of the NGSS.

## Recommendations to Strengthen Science Education Through LCAP Planning and Budgeting

All school districts in California are required to address the NGSS in their LCAP as part of State Priority #2: Implementation of State Standards. To support this, local stakeholders should advocate that district leaders ensure their LCAPs:

- 1 Make implementation of the NGSS a leading priority in the LCAP plan.** While NGSS may be functionally integrated with CCSS implementation (e.g., as part of a district's comprehensive professional learning plan), separate and specific goals, performance metrics and funding allocations for science should be clearly established in the LCAP.
- 2 Include a robust plan for teacher development.** Districts must invest in capacity to support teachers to make the pedagogical shifts required by the NGSS, from strategies to help all elementary teachers integrate science into their daily instruction to building corps of science coaches and science specialists who can support job-embedded professional learning.
- 3 Differentiate goals and strategies by grade level** to recognize the very different challenges and resource requirements the NGSS bring to pedagogical practices in elementary vs. middle vs. high schools.
- 4 Ensure resources are directed to close equity gaps** and encourage women, African-American, Latino, Native American and other students from under-represented or at-risk groups to enroll and persist in science coursework. Districts must also focus on ensuring that their teacher assignment policies ensure that high need schools are staffed by teachers with experience and appropriate credentials to teach science.
- 5 Use the LCAP 3-year plan horizon** to identify the phase-in of activities that will be needed to bring the district to full readiness for NGSS implementation by fall 2018. For example, this might include early investments in professional learning to build a cadre of science coaches and lead teachers to support professional development across the faculty or stretching out the high costs of building new science

## LEADING EXAMPLES OF SUPPORT FOR SCIENCE IN LCAPS

Our review observed a number of strong examples of NGSS implementation that can provide insights to districts as they continue trying to determine how to leverage LCFF and LCAPs to improve access to science and STEM education for all students. A small sampling of these promising practices includes:

### **Specific Programming with Clear Finances:**

Individual districts dedicated specific dollar amounts for (a) focused development/delivery of project-based learning; (b) summer programming for low-income students; (c) Project Lead the Way expansion; (d) Science Center support services; (e) progressive investments in middle school science or STEM activities.

### **Professional Learning to Support Science**

**Teaching:** Districts planned and budgeted for critical activities to build the teaching capacity to deliver on our new science standards, such as: (a) specific training for teacher leaders to learn to write discipline-specific curriculum; (b) clearly delineated, staged activities to achieve early implementation of NGSS by all teachers; (c) training master teachers; (d) introducing all teachers to the fundamental changes of NGSS; and (e) partnership with Lawrence Livermore and BaySci Teacher Leadership Cadre to support teacher development.

**Targeting LCFF Student Sub-Groups:** One district focused its STEM initiatives on serving English learners, foster youth, and low-income students.

### **Infrastructure to Support and Promote Science and/or STEM:**

Districts identified such disparate actions and investments to promote STEM learning as: (a) needed improvements to science labs; (b) reviewing core academic programs and developing 6-year plans to broaden them to include STEM; (c) developing comprehensive career pathways including STEM programs such as computer science; (d) establishing an advisory group and recruiting business and postsecondary partnerships to enhance STEM-integrated Linked Learning and CTE programs.

These examples reflect a broad diversity of local needs. But each of them demonstrates how districts can foster progress by defining clear and measurable goals and objectives; describing specific actions, and allocating clear funding that is aligned to effectively carrying them out.



lab facilities over multiple years. Multi-year funding should allow districts to plan thoughtfully for how to grow and sustain the budget allocations that will be needed to support full implementation of the NGSS by 2018.

- 6 Invest in specific, scalable programs and strategies that will leverage external resources** to enhance science learning opportunities for students. For example, coordinating partnerships with businesses and higher education institutions to support career pathway and CTE programs focused on STEM careers; aligning instruction with expanded learning programs during afterschool and summer; or engaging with museums and science centers to expand hands-on learning for students and professional development opportunities for teachers.

## State Policy Recommendations

In addition to engaging locally to strengthen LCAPs, STEM advocates can also support strong NGSS implementation by encouraging state policymakers, including their state legislators, members of the State Board of Education, and the Governor to make the following improvements in state policy:

- 1 Expand communications** to make it absolutely clear to educators, district administrators, school board members and to the public that the NGSS, and other state standards beyond the CCSS, must be addressed as part of State Priority #2 in every LCAP as well as in other appropriate Priorities as mentioned previously. The focus and extent of each district's NGSS-related activities may vary, reflecting the early stage of implementation, but it must be clear what districts are doing to be prepared for full implementation of the NGSS by 2018.
- 2 Provide districts with sufficient resources** to cover the costs of high-quality NGSS instruction, including delivering the full funding called for through the LCFF and providing short-term annual supplements to cover the higher one-time start-up costs associated with transitioning to the new standards.
- 3 Ensure that the state's LCAP evaluation rubric puts science on par** with ELA and math. The state

is developing a new system to evaluate LCAPs and whether districts are making progress on their goals. The LCAP Evaluation Rubric now under development must include performance metrics and progress measures that will encourage school districts to offer rigorous science learning at every grade and to ensure that high-need students have equitable access to advanced STEM learning opportunities.

## What Comes Next?

The work of STEM advocates will not be done once the LCAPs for the 2015-16 school year are completed. Ongoing monitoring of district activities is important to make sure that expenditures and actions on the ground match the intentions set out in the LCAPs. Local advocates will need to stay engaged to serve as partners and information sources, as well as progress monitors. Involvement of parents, businesses, afterschool program providers, museums, colleges, universities and others, together with educators, is essential to help create the more compelling learning experiences and expanded resources needed to deliver on the promise of NGSS to transform science and STEM education for all our students. Further, advocates will also need to weigh in and test the new LCAP Evaluation Rubric and other accountability tools and supports the state will be developing. CSLNet will also provide additional information and tools to help STEM advocates monitor and shape district LCAPs — including a reissue of this report later this year to look at whether 2015-16 LCAPs give more attention to science and STEM.

California has embarked upon an historic journey to reshape our public education system to meet the demands of the 21st Century. High-quality STEM education is an essential component of that new system. The efforts that we make today to ensure successful implementation of California's new state standards in every district in the state can open the doors of opportunity for all our students for decades to come.

## Research Methodology

For this study, CSLNet reviewed the LCAPs of 88 districts in July/August 2014 — those districts collectively serve some 2.5 million students. While not designed to be statistically representative of California’s student demographics, the districts we surveyed do serve large numbers of high-need students and represent students from all parts of the state. The sampled districts included (a) the state’s 50 largest districts; and (b) the largest district in each county (if not already represented among the 50 largest). Of these 93 districts, five did not have their LCAPs publicly available at the time of our research.

To conduct the research, we developed a survey to identify key data we wished to compile from each LCAP. We conducted keyword searches for such terms as STEM, NGSS, science, etc., and conducted reviews of individual LCAPs to examine how those terms were applied. We considered districts’ goals for high-need subgroups, and assessed whether metrics existed that could determine effectiveness of STEM-related activities. Finally, we identified whether specific funding allocations or program/service/professional development activities were cited, and whether they represented pre-existing or enhanced program/funding levels.

## Endnotes

- 1 USC Dornsife-LA Times Poll. See LA Times story as reported April 13, 2015 at <http://www.latimes.com/local/lanow/la-me-ln-technology-poll-20150410-story.html>
- 2 Anthony P. Carnevale et al., Projections of Jobs and Education Requirements Through 2020, Georgetown University Public Policy Institute, Center on Education and the Workforce, June 2013.
- 3 Employment Projections Program, U.S. Department of Labor, U.S. Bureau of Labor Statistics, Employment by Occupation, BLS:2009. [http://www.bls.gov/emp/ep\\_table\\_102.htm](http://www.bls.gov/emp/ep_table_102.htm).
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- 5 2011 Trends in International Math and Science Studies (TIMSS). [http://nces.ed.gov/timss/pdf/results11rev\\_California\\_Science.pdf](http://nces.ed.gov/timss/pdf/results11rev_California_Science.pdf).
- 6 See <http://www.cde.ca.gov/fg/aa/lc/lcffffaq.asp#LCAP>.

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## About CSLNet

California STEM Learning Network’s (CSLNet) mission is to prepare the nation’s most STEM capable graduates by coordinating and activating a multi-sector statewide network representing all STEM stakeholders. Through this cross-sector collaboration, CSLNet fosters innovation and helps to scale and sustain high-quality STEM teaching and learning for all students.

