

California Online Mathematics Education Times (COMET)

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California Mathematics Project: <http://www.cmpso.org>

California Online Mathematics Education Times (COMET) is an electronic news bulletin providing STEM-related news from California and across the nation, as well as information about professional events and opportunities, current educational issues, and online resources.

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ARTICLES & ANNOUNCEMENTS: CALIFORNIA FOCUS

(1) State Task Force Produces Blueprint for STEM Education in California

Sources: California Department of Education; California STEM Learning Network

URL: www.cde.ca.gov/nr/ne/yr14/yr14rel71.asp

On Monday morning (June 30), State Superintendent of Public Instruction Tom Torlakson released *INNOVATE: A Blueprint for Science, Technology, Engineering, and Mathematics in California Public Education* at the Exploratorium in San Francisco. "California is in a new era of education where getting students ready for college and career means acknowledging the needs of tomorrow's workforce," Torlakson said. "The new *Blueprint for STEM* will help us chart that course for the future and meet that demand."

The report was produced by the superintendent's STEM Task Force, which Torlakson and Assemblywoman Susan Bonilla charged two years ago with drafting a new vision and direction for STEM education in the state. Co-chaired by Herb Brunkhorst (Chair of the Department of Science, Mathematics, and Technology Education at California State University, San Bernardino) and Susan Hackwood (Executive Director of the California Council on Science and Technology), the Task Force members examined the status of STEM learning in the state, including curriculum, instructional practices, professional development for teachers, student testing, existing infrastructure, and partnerships with the community and business. (See www.cde.ca.gov/eo/in/stemtf.asp for a list of Task Force members and more details.)

The resulting *Blueprint for STEM* (www.cde.ca.gov/pd/ca/sc/documents/innovate.pdf) offers recommendations in seven primary strategic areas to expand and improve STEM education in California (see pages 32-34 in the report):

- 1 - Public Awareness:** Increase public awareness about the importance of STEM education to ensure support for these fields of study.
- 2 - Resources:** Increase support for STEM learning from government, business, charities, and communities through partnerships.
- 3 - Access:** Make high-quality STEM experiences and programs accessible to all students in and out of school, before and after school, and to underrepresented youth and girls.
- 4 - Framework:** Establish guidance for STEM teaching and learning in all grades that align with the Common Core State Standards (www.cde.ca.gov/re/cc/index.asp) and the Next Generation Science Standards (www.cde.ca.gov/pd/ca/sc/ngssstandards.asp).
- 5 - Professional Learning:** Adopt policies and standards to train teachers in STEM education.
- 6 - Assessment and Accountability:** Consider STEM in the state's testing and accountability systems.
- 7 - Availability of STEM Materials:** Ensure that STEM programs can identify and access excellent learning resources.

The *Blueprint for STEM* notes that California is in a prime position for enhancing STEM education, as the state is actively engaged in remodeling the K-12 system through Common Core and Local Control Funding Formula (www.cde.ca.gov/fg/aa/lc/lcffoverview.asp) implementation.

Dennis Bartels, Executive Director of the Exploratorium, stated, "A generation that's fluent in the experiential and analytical skills inherent in the STEM fields will be equipped to ask hard questions, seek deeper knowledge, take risks and tackle the challenges before us. And so, I commend Superintendent Torlakson, Assemblywoman Bonilla and the entire 54-member Task Force for the completion of this report, which will provide a much-needed design for the future of STEM Education in California."

Bartels also noted that the recommendations closely align with the California STEM Learning Network's goal of advancing and shaping STEM education and policy in California. (See CSLNet's reports and policy briefs at www.cslnet.org/resources/cslnet-publications.) On Wednesday afternoon (July 2), CSLNet CEO Chris Roe hosted a conference call for CSLNet regional site leaders to share details of the report, invite comment, and discuss implementation ideas. CSLNet will work closely with state agencies, industry, educators, and the public to create awareness of the document and help implement its recommendations.

Superintendent Torlakson also encourages educators to attend the Second Annual California STEM Symposium on September 21-23, 2014, in San Diego as part of continuing efforts to enhance STEM education in California. The symposium will showcase STEM programs, curriculum, strategies, resources, Common Core, and the Next Generation Science Standards. More than 200 presenters will share their best practices, and attendance is expected to exceed 3000. For more information, visit <http://cdefoundation.org/stemsymposium/>

(See COMET item below on the Royal Society's new publication, *Vision for Science and Mathematics Education*, which is similar to the *Blueprint for STEM*.)

(2) Approval of the 2014 ELA/ELD Framework Anticipated at Next Week's Meeting of the State Board of Education

URL (Agenda): www.cde.ca.gov/be/ag/ag/yr14/agenda201407.asp

At next week's meeting of the California State Board of Education (SBE), action will be taken on the draft English Language Arts/English Language Development curriculum framework. A final prepublication draft of the ELA/ELD framework will be posted on www.cde.ca.gov/ci/rl/cf/elaeldfrmwrkchptrs2014.asp later this summer. The framework includes evaluation criteria for the adoption of ELA/ELD instructional materials aligned to both the *California Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects (CA CCSS for ELA/Literacy)* and the *California English Language Development Standards (CA ELD Standards)*.

Public comment on the draft framework will be heard, and written comments will be presented at this meeting. Because the framework includes numerous references to science, the California Science Teachers Association (CSTA) provided detailed input, including questioning the inclusion of a reference to inertia in a 6th grade vignette on Richard Feynman, noting that "forces and inertia are not 6th grade standards for the preferred [CA NGSS] interdisciplinary model (or for the non-preferred discipline specific model)."

COMET readers who are not familiar with the ELA/ELD framework may wish to peruse it because of the STEM-related references that are included. The Feynman lesson, for example, appears on pp. 82-93 in Chapter 6:

www.cde.ca.gov/ci/rl/cf/documents/chapter06may2014.pdf

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Related:

(2a) Science Framework Guidelines and Prospective CFCC Members to be Presented at July Meeting of the State Board of Education

Also on the July SBE meeting agenda is Item 14, in which "the California Department of Education (CDE) recommends that the SBE: (1) approve the *Curriculum Framework and Evaluation Criteria Committee Guidelines for the 2016 Revision of the Science Framework for California Public Schools (Science Guidelines)*, as recommended by the IQC (Instructional Quality Commission), and (2) appoint twenty members to the [Science Curriculum Framework and Evaluation Criteria Committee (CFCC)], including Mr. Robert Sherriff and Dr. Helen Quinn as Co-Chairs of the Science CFCC, as recommended by the IQC."

Download this agenda item from

www.cde.ca.gov/be/ag/ag/yr14/documents/jul14item14.doc Summary information on the applicants for the CFCC can be found on

www.cde.ca.gov/be/ag/ag/yr14/documents/jul14item14a1.pdf

(3) CSU Campuses Join National Partnership to Improve Secondary Mathematics Teacher Preparation

Contact: Joan Bissell, Director of Teacher Education and Public School Programs, California State University

Mathematics teacher educators from California State University (CSU) campuses convened in Long Beach on June 23 to learn more about the Mathematics Teacher Education Partnership (MTEP). This national partnership, which was established in 2012 by the Association of Public and Land-grant Universities (APLU), is committed to providing a coordinated research and development strategy to advance implementation of reforms in secondary mathematics teacher preparation. Its goal is to assist universities' teacher preparation programs in meeting the challenges of the Common Core State Standards for Mathematics through best practices in the field. (See below for a related article co-authored by CSU Chancellor Timothy White.)

The Partnership endeavors to accomplish the following:

1. Build a national consensus on guiding principles for the preparation of mathematics teachers;
2. Promote partnerships among all sectors throughout the teacher development process;
3. Develop and coordinate a networked research and development agenda;
4. Serve as a clearinghouse for model programs and practices; and
5. Advocate for change at university, state, and national levels.

At the time of MTEP's inception, one CSU campus (Fullerton) represented the CSU system. APLU recently invited additional institutions to join, and through the efforts of APLU and the CSU Chancellor's Office, all 22 of the CSU campuses with teacher education programs joined MTEP. At the June 23 meeting, representatives from these campuses heard from APLU Executive Vice President and MTEP Co-Chair Howard Gobstein and his MTEP Co-Chair, W. Gary Martin, Distinguished Professor of Mathematics at Auburn University, as well as from CSU faculty members who attended the 2014 MTEP conference earlier in June.

The Partnership is employing the [Networked Improvement Community](#) design developed by the Carnegie Foundation for the Advancement of Teaching and has identified Research Action Clusters (RACs), which were discussed at the Long Beach meeting. The launch of the RACs is supported by a grant from the Leona M. and Harry B. Helmsley Charitable Trust.

For more information on MTEP, visit www.aplu.org/page.aspx?pid=2184

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(3a) "Use the Common Core. Use It Widely. Use It Well." by William E. (Brit) Kirwan, Timothy P. White, and Nancy Zimpher

Source: *The Chronicle of Higher Education* - 10 June 2014

URL: <http://chronicle.com/article/Use-the-Common-Core-Use-It/147007?cid=megamenu>

Chancellors of three major statewide university systems (including California State University) have co-authored an opinion piece strongly supportive of the Common Core State Standards as well as the work of the two consortia of states that are developing CCSS-related assessments. A brief excerpt from the opening of this article follows below:

"Many of us in higher education have observed an increasing number of students arriving at our doorstep not fully prepared to pursue a college degree... Fortunately, there's a solution that most states and many others are pursuing: the Common Core State Standards. This effort holds tremendous promise, but it has recently become the subject of a great deal of

misinformation and misunderstanding. To show our support for Common Core, the three of us are joining more than 200 other postsecondary leaders across the country to start a coalition called Higher Ed for Higher Standards (<http://higheredforhigherstandards.org/>). We invite our fellow university chancellors, college presidents, and others in academia to learn more about these standards and to join us in this effort to preserve them..." (Note: Nearly all of the CSU Presidents have endorsed this effort.)

(4) Preservice Teacher Candidates are Invited to Apply for Position on Teacher Credentialing Commission

At its June 13-14, 2013 meeting, the California Commission on Teacher Credentialing's Executive Committee amended its policy manual to provide for the appointment of a student enrolled in an educator preparation program to represent the views and experiences of students as a liaison to the Commission.

The appointment will be made by the Commission's Executive Committee at the October 2014 Commission meeting. Interested students must complete the application form (download from www.ctc.ca.gov/commission/pdf/ep-liaison-app.pdf) and send it, with all additional requested attachments, to the attention of the Executive Office at the address provided on the form. The application deadline is **Friday, July 11**.

Travel costs for participation in this one-year appointment (1 October 2014-30 September 2015) will be covered by the Commission. Questions can be directed to HaiJue Theriault in the Executive Office at htheriault@ctc.ca.gov.

(5) Upcoming STEM Conferences in California

(a) California STEM Symposium: http://cdefoundation.org/stem_symposium/

Dates: September 22-23, 2014

Location: San Diego Convention Center

(b) California Mathematics Council (CMC)

* **CMC-South:** www.cmc-south.org/conferences.html

Dates: October 24-25, 2014

Location: Palm Springs

* **CMC-North:** cmc-math.org/conferences/cmc-north/

Dates: December 5-7, 2014

Location: Asilomar Conference Center, Pacific Grove, CA

(c) Computer-Using Educators

* **Fall 2014 Conference:** www.cue.org/fall

Dates: October 24-25, 2014

Location: American Canyon High School, Napa Valley, CA

* **Spring 2015 Conference:** www.cue.org/conference/present

Dates: March 19-21, 2015

Location: Palm Springs Convention Center

Note: Speaker applications are currently being accepted -- see website above.

(d) California Science Teachers Association (CSTA), in collaboration with the National

Science Teachers Association (NSTA)

URL: www.cascience.org/csta/conf_home14.asp

URL (Reg.) <https://secure.nsta.org/conferences/registration/default.aspx?id=2014LON>

Dates: December 4-6, 2014

Location: Long Beach, CA

(6) K-12 Computer Science Bills Move Through the Legislature

All of the computer science bills profiled in last month's issue of COMET have made legislative progress. (Refer to <http://tinyurl.com/comet-june72014> for summaries.)

On July 2, **AB 1539** (Content standards: computer science) was revised to move the adoption timeline to July 31, 2019 from July 31, 2016. In addition, the original bill stated that the Instructional Quality Commission (IQC) would be required to produce standards in computer science and also required the Superintendent of Public Instruction (SPI) to convene a panel of experts to develop the standards. The bill wording was changed to have the IQC *consider* developing standards in computer science and for the SPI to *consider* convening a panel of experts. Also, if such a panel is convened, new wording also expands the grade span of teachers eligible to serve on the panel from those teaching in grades 7-12 to those teaching in grades K-12.

AB 2110 (Pupil instruction: computer science) requires the IQC to consider incorporating computer science curriculum content into the mathematics, science, history-social science, and language arts frameworks. Last week, Senate Education Committee staff noted that science would likely be the only framework that computer science would be incorporated into within the next few years. It was also noted that should standards for computer science be developed, it is likely that a framework specific to computer science would subsequently be developed.

AB 1530 (Model curricula: computer science) now includes revised language to require that the Superintendent of Public Instruction consider identifying existing computer science model curricula for grades K-12 and "recommending for the revision of existing, or the development of new, model curricula for K-6 on computer science, and submitting, on or before July 1, 2017, the recommended model curricula to the State Board of Education for adoption. Upon adoption, the Superintendent shall make the model curricula available on the department's Internet Web site."

AB 1764 (School curriculum: mathematics: computer science) was amended on Monday to allow a district to award mathematics credit for a computer science course taken by a pupil, even if that pupil were also awarded credit in science, visual arts, foreign language, or career technical education for that same course.

AB 1540 (Concurrent enrollment in secondary school and community college) includes language that exempts college-level computer science courses from inclusion in a high school principal's 5% limitation on the number of pupils in each grade level allowed to enroll in a community college during a summer session.

For more legislative information, visit <http://leginfo.legislature.ca.gov/faces/home.xhtml>

(7) "California STEM Weekly"

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## ARTICLES & ANNOUNCEMENTS: NATIONAL/INTERNATIONAL FOCUS

### (1) The Royal Society in the UK Releases New Agenda on Mathematics and Science Education

URL: <https://royalsociety.org/education/policy/vision/>

URL (Full Report):

<https://royalsociety.org/~media/education/policy/vision/reports/vision-full-report-20140625.pdf>

URL (Summary Report):

<https://royalsociety.org/~media/education/policy/vision/reports/vision-summary-report-20140625.pdf>

*Vision for Science and Mathematics Education* is a new report released by UK's Royal Society that mirrors efforts in the United States to reform and update pre-collegiate mathematics and science education. Visit <https://royalsociety.org/education/policy/vision/> to learn more. Also see excerpts below from the summary report where elements of the vision are identified:

- \* **All young people study mathematics and science up to the age of 18.** Create new baccalaureate-style frameworks that encompass vocational and academic learning across a broad range of subjects to age 18.
- \* **Curricula and their assessment are stabilized and support excellent teaching and learning.** Use the expertise and independence of the STEM professional bodies, under strong overarching bodies, to stabilize the curriculum and assessment, providing quality and coherence in 5–18 science and mathematics education.
- \* **Teachers have high professional status and there is a strong supply of science and mathematics specialists.** Widen access to science and mathematics teaching and enhance their appeal to prospective entrants and returners by expanding the STEM professional community's role in recognizing professionalism in teaching.
- \* **Students understand the significance of STEM through better careers awareness and guidance.** Maintain investment in large-scale, national programs and events, delivered locally, which provide students with STEM role models and help teachers and families to develop better engagement with academia and industry
- \* **The success of students, teachers and education systems is judged through appropriate and broadly based assessment and accountability measures.** Ensure teachers have an increased role in assessing student achievement in public qualifications. Judge the health of the school and college systems through broader measures including ones that reflect the features of high quality STEM education.
- \* **Education policy and practice are better informed by evidence.** Enhance collaboration and communication between science and mathematics education researchers, scientists and mathematicians, teaching professionals, policy-makers and the public.

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## (2) "Still Searching: Job Vacancies and STEM Skills" by Jonathan Rothwell

Source: The Brookings Institution

URL: [www.brookings.edu/research/interactives/2014/job-vacancies-and-stem-skills](http://www.brookings.edu/research/interactives/2014/job-vacancies-and-stem-skills)

On Tuesday, July 1, the Brookings Institution issued a report of findings from a study that analyzed "the skill requirements and the advertisement duration time for millions of job openings [in 100 large Metropolitan areas, providing]..new evidence that post-recession STEM skills, particularly those associated with high levels of educational attainment, are in high demand among employers. Meanwhile, job seekers possessing neither STEM knowledge nor higher education face extraordinary levels of competition for a scarce number of jobs."

The complete report, "Still Searching: Job Vacancies and STEM Skills," can be downloaded from <http://tinyurl.com/brookings-stem>. An interactive version of the report is available at the website above. Findings include the following, excerpted from the report:

**- Job openings for STEM positions take longer to fill than openings in other fields.**

The median duration of advertising for a STEM vacancy is more than twice as long as for a non-STEM vacancy... Even sub-bachelor's STEM job openings take longer to fill than non-STEM jobs requiring a bachelor's degree. Health care and computer openings are advertised 23 and 15 days longer, on average, than openings for non-STEM occupations... STEM skills are in short supply in the labor market, relative to demand.

**- Specific high-value skills requested by employers and common to STEM occupations are particularly scarce relative to demand and yet particularly valuable to employers.**

Computer skills are associated with the highest salaries and longest advertisement duration times among all major occupational groups. Employers advertised 255 distinct computer skills in at least 500 job openings for an average of 40 to 71 days on their websites.

**- The regional supply of workers in a given occupation affects the length of vacancy advertisements.**

The typical job opening in an occupation for which the regional unemployment rate was below 3 percent was advertised for 16 days; most of these occupations are in STEM fields. By contrast, the typical job opening was advertised less than half that duration (seven days) for occupations [in cities] with regional unemployment rates above 10 percent...

For STEM jobs requiring a bachelor's degree or higher, Fresno, CA has the longest average duration, at 68 days. Health care practitioner jobs in Fresno are advertised for 74 days on average, and the length is 71 and 108 days, respectively, for computer and life, physical, and social science jobs in the area. [In addition, the proportion of STEM occupations among all advertised jobs in Fresno is 30%, 93rd in the study.] In San Jose, it takes 59 days on average to fill a STEM job requiring a bachelor's degree, and 54 days in San Francisco...

At the bachelor's level, industrial and commercial design occupations are among the STEM art and design occupations that advertise for long periods--49 days on average. Engineering positions advertise 45 days, as do education-related STEM positions. Computer occupations at the bachelor's level--with software developers being the most common--advertise 43 days, as do various managerial STEM positions including engineering managers, computer managers, and industrial, financial, and loss-prevention managers.

At the master's level, STEM jobs in engineering advertise the longest (61 days), followed by education (54), science (50), computers, (48), health care (47), and management (41). Finally, at the Ph.D. or professional-degree levels, vacancies last 58 to 45 days, on average, for jobs spread across managerial positions (58 days), computer occupations (53 days), engineering (52), science (51), and health care (45)...



Since the start of the recession in 2007, no occupational category has added net jobs at a faster rate than computer and mathematical occupations, which experienced 21 percent growth and a net increase of 725,000 jobs. The next-fastest-growing category has been health care practitioner occupations, which increased by 16 percent from a larger base and added 1.2 million jobs on net...

The skills common to computer occupations are collectively the most valuable in the economy at present, at least as reflected by job advertisements that report specific salaries and are advertised on company websites.,, The most valuable computer skills include data visualization, process management, natural language processing, automation tools, wireless telecommunications, machine learning, software as a service, game development, Android software development, and structured query reporter. Each of these skills is worth well over \$100,000 in average salary, as advertised in early 2013... Not only are computer skills the most valuable, they are advertised for the longest period of time, suggesting that they are the most difficult to fill...

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**Related article:**

**(2a) "Jobs Requiring Math, Technology Skills Hard to Find, Harder to Fill in Fresno Area"**

by Tim Sheehan

**Source:** *The Fresno Bee* - 30 June 2014

**URL:** [www.fresnobee.com/2014/06/30/4004505/stem-jobs-hard-to-find-harder.html](http://www.fresnobee.com/2014/06/30/4004505/stem-jobs-hard-to-find-harder.html)

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