

STRENGTHENING THE K-12 STEM TEACHER PIPELINE IN CALIFORNIA

AUGUST 6, 2020



TODAY'S PRESENTERS

- Eric Hoyer, Consultant, CSBA
- Mary Briggs, Education Policy Analyst, CSBA
(Moderator)

STRENGTHENING THE STEM TEACHER PIPELINE

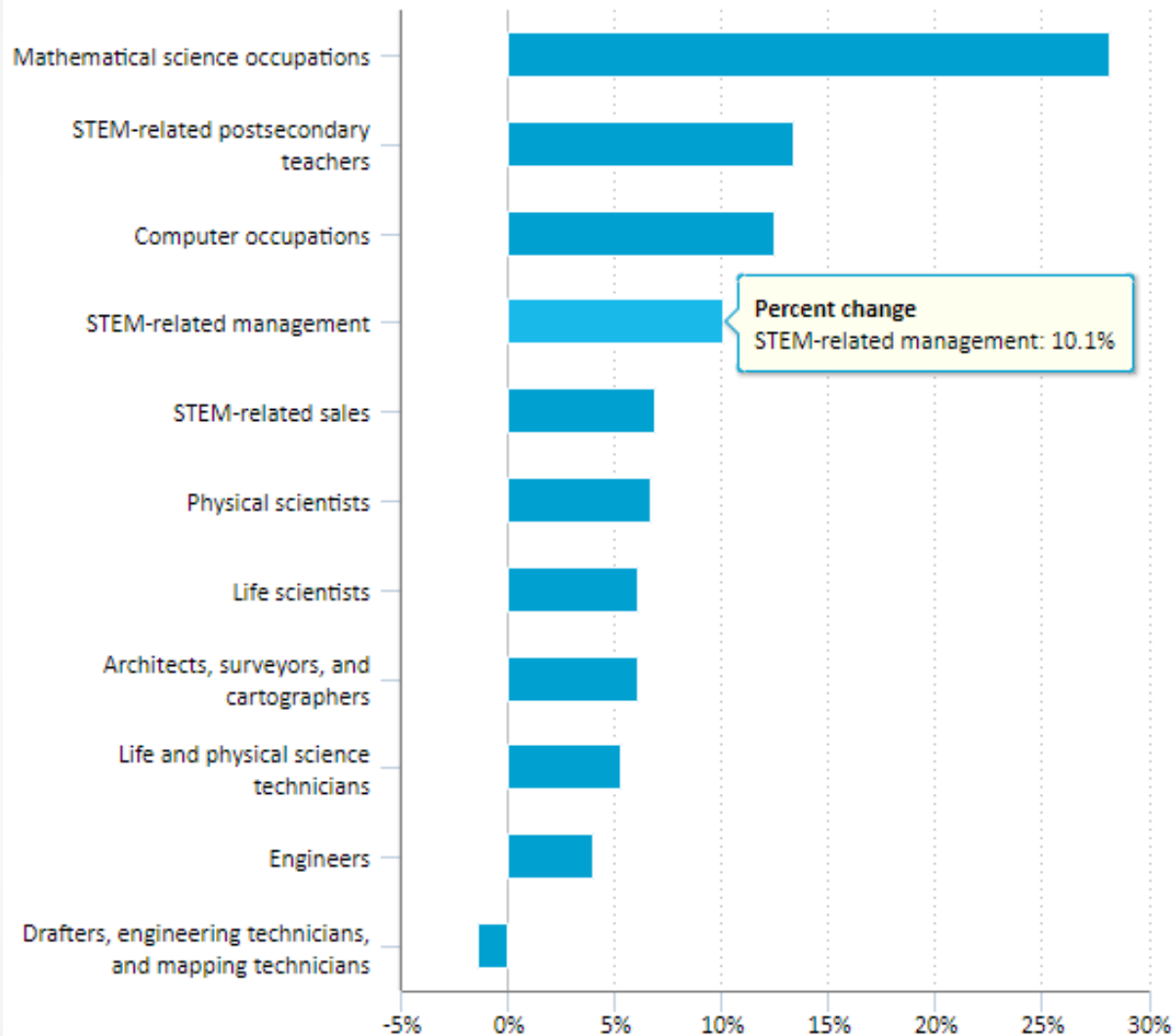
Eric Hoyer
Consultant, CSBA



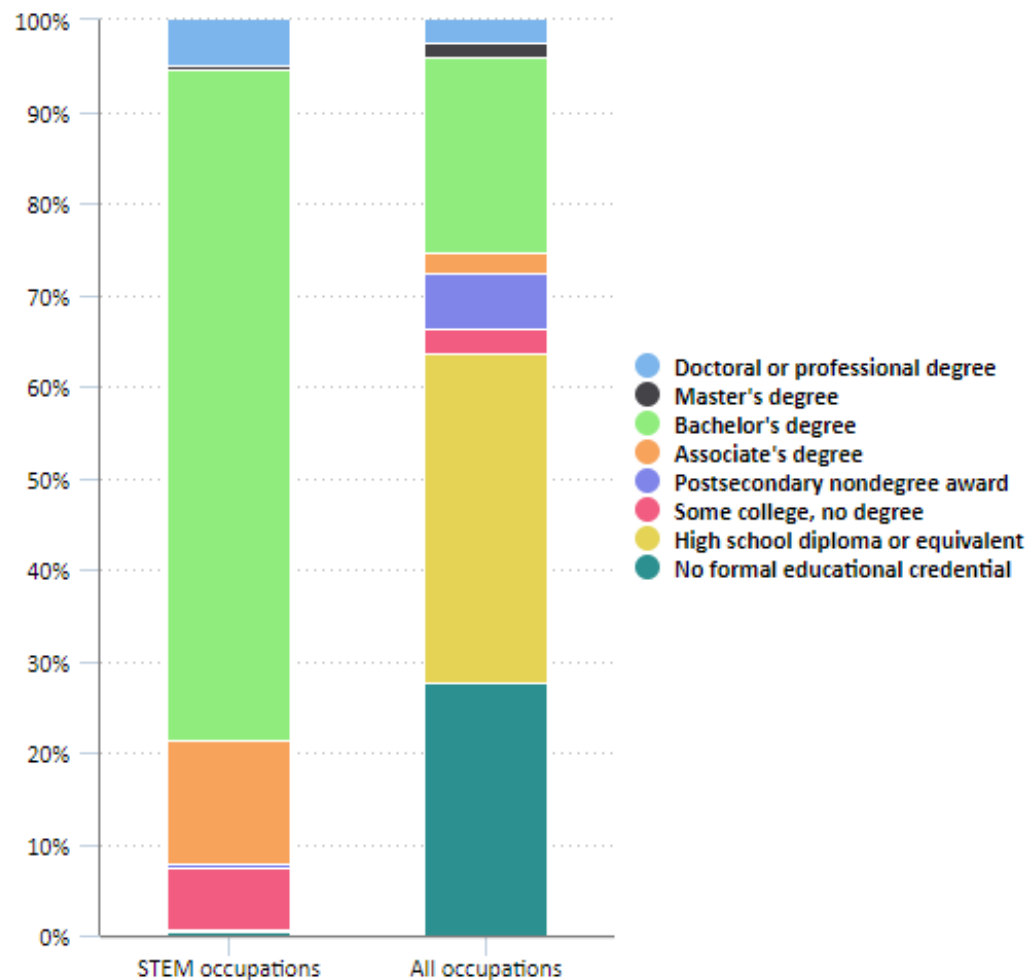
GOALS

- The extent of the teacher shortage in STEM
- Contributing factors to the recruitment and retention issues faced by LEAs.
- Promising strategies and policies
- Questions for board members

Projected growth rates for types of STEM occupations, 2014 to 2024



WHAT EDUCATION STEM JOBS REQUIRE



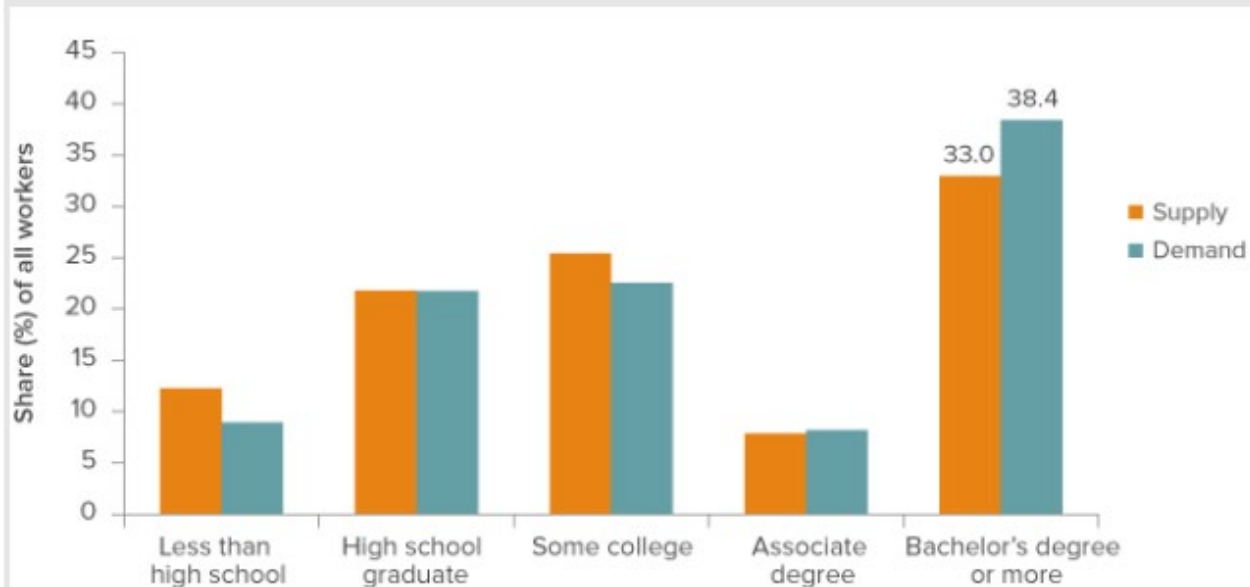
TOP CALIFORNIA JOBS

Top 15 Fastest Growing Jobs 2016 - 2026 and Median Salaries

1. Personal Care Aides \$24,419
2. Food Prep and Serving \$25,232
3. Transportation and Material Moving \$32,260
4. Healthcare Practitioners \$86,619
5. Construction and Extraction \$54,394
6. General and Operations Managers \$117,727
7. Business and Financial Specialists \$75,454
8. Computer and Math Jobs \$102,034
9. Education and Training \$55,302
10. Healthcare Support Jobs \$34,983
11. Administrative Support Staff \$39,132
12. Retail and Wholesale Sales \$31,001
13. Building and Grounds Cleaning and Maintenance \$30,108
14. Software App Developers \$123,085
15. Registered Nurses \$102,288

CALIFORNIA'S NEED FOR BACHELOR'S DEGREE HOLDERS

Figure 1. Demand for highly educated workers will exceed supply in 2030



SOURCE: Authors' projections.

NOTE: See the [technical appendices](#) for data and methods.

RECRUITMENT AND RETENTION

➤ **New Teachers**

- 26% to 50% leave within 5 years

➤ **Teacher Turnover Costs**

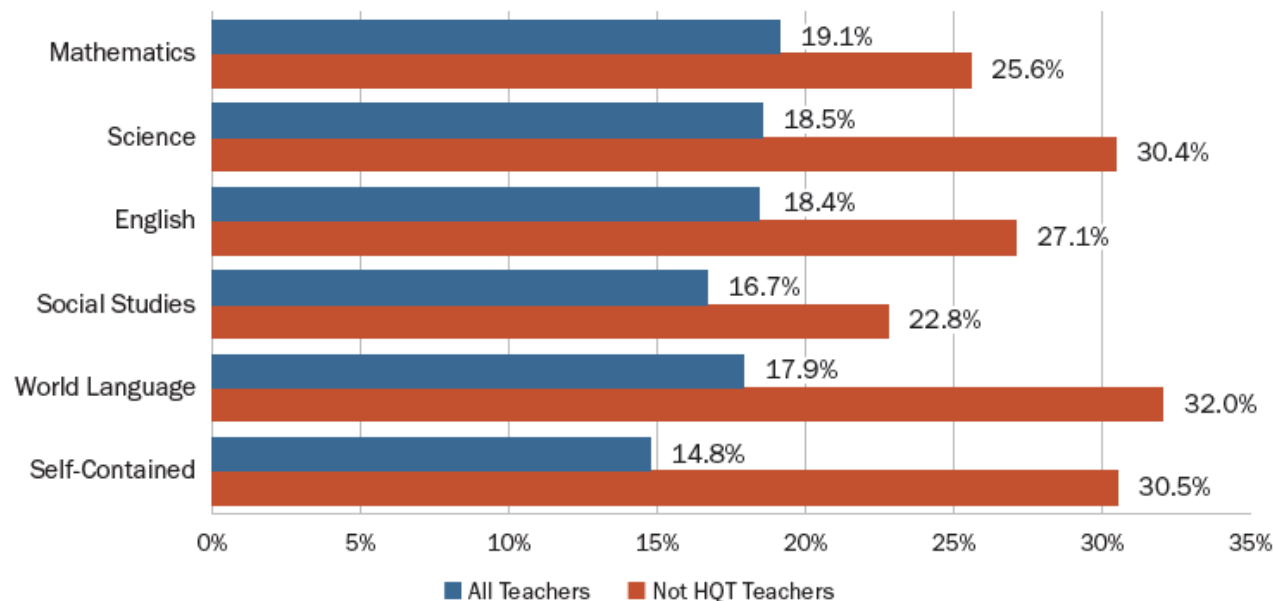
- \$9 billion per year (nationally)
- 67% of turnover is non-retirement

CSBA SURVEY

- **75%** of districts reported having a shortage of qualified teachers
- **4 of 5 districts** say the problem has gotten worse in recent years (2016)
 - n=200
- **76%** of HR staff reported having teacher shortages (2018)
 - n=206

STEM TURNOVER

**Teacher Turnover by Subject and Highly Qualified Teacher Status
Between 2015–16 to 2016–17 School Years**

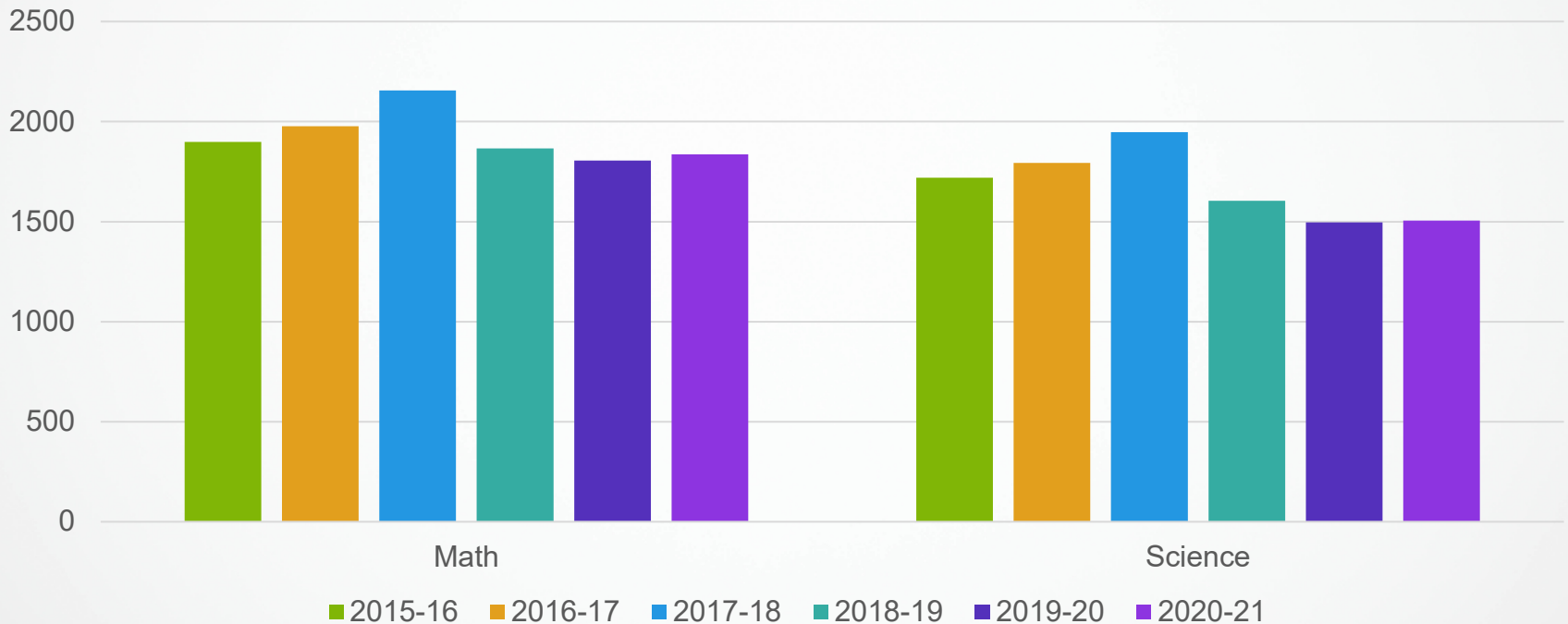


Note: Self-contained classes include both elementary school classrooms and special education classrooms. Not HQTs, or not highly qualified teachers, are teachers who did not meet the designation of “highly qualified” under the former federal education law, No Child Left Behind. A highly qualified teacher in California is defined as a teacher who holds a bachelor’s degree, a teaching or intern credential, and has demonstrated core academic subject-matter competence. In this analysis, not highly qualified teachers are teachers who lack an appropriate subject-matter credential for the courses they teach.

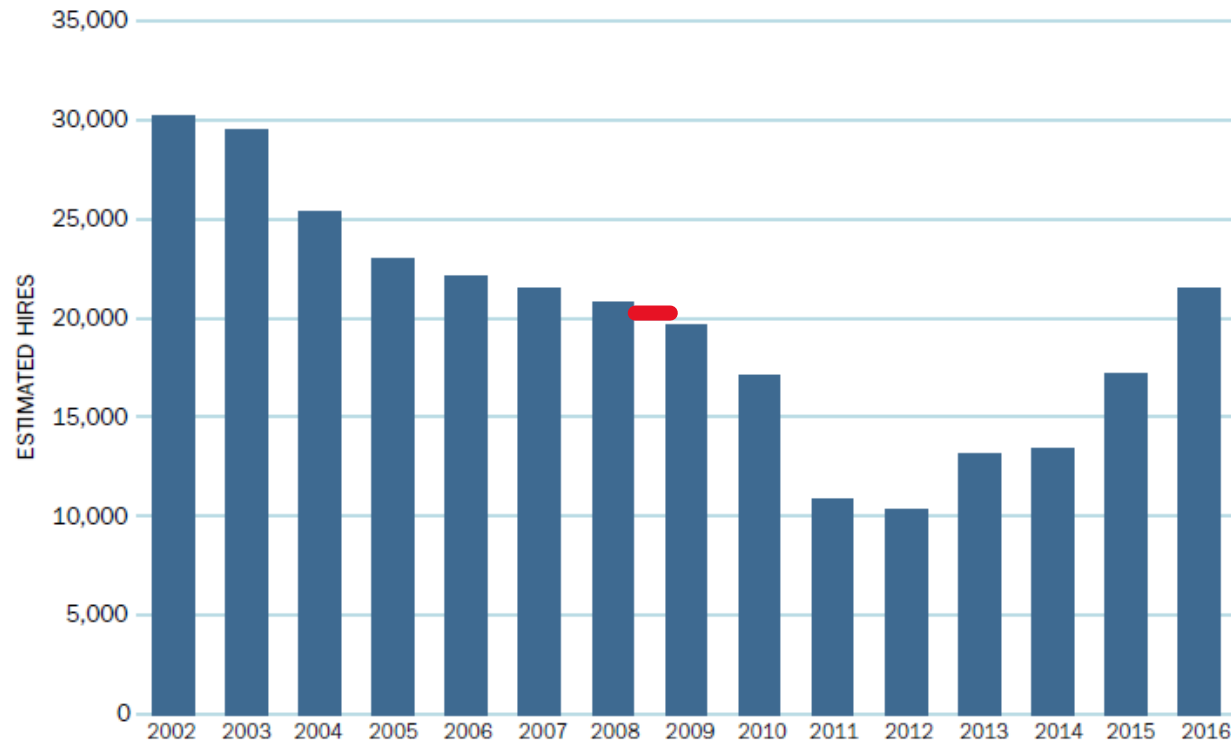
Source: California Staffing Data File analyzed by the Learning Policy Institute, provided by the California Department of Education through a special request.

NEW HIRES IN STEM

**Estimated New Hires in CA, 2015-16 to 2020-21
Math & Science**



ALL NEW HIRES, 2002-2016



Estimated new hires in California, 2001-02 to 2015-16

Source: California Department of Education 2002-2016. Data available at <http://data1.cde.ca.gov/dataquest/>.

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WHY TEACHERS LEAVE (NON-RETIREMENT)

Top Reasons Teachers Leave	Key Finding for Leaving the Profession
Inadequate Preparation of Novice Teachers	2.5x more likely
Lack of Support	2x more likely
Challenging Working Conditions (e.g. lack principal support, time for teacher collaboration)	Often the top reason
Compensation	Beginning teachers earn 19% less than their BA holding peers
Better Career Opportunities	1 in 4 teachers pursue other career options

WHY A TEACHER MIGHT RETURN

- Salary (67%)
- Smaller class size (61%)
- Student Loan Forgiveness, Housing Incentives (25% each)
- Retirement portability (68%)
- Simpler recertification requirements; transfer certification between states (41% each)

TEACHER COMPENSATION COMPARISON (NATIONALLY)

1994

2%

**Behind average BA
holder**

2019

19%

**Behind average BA
holder**

NON-TEACHER STEM PROFESSIONALS COMPARED TO TEACHERS

- By mid-career: 40% to 50% wage premium over K-12 teachers.

CONSTRAINTS IN RAISING COMPENSATION

- Overall funding level for K-12 education
- Collective Bargaining Agreements provisions can limit differential pay
- Hiring bonuses for STEM teachers are only specified in 1% of California CBAs.
 - Hard to recruit areas: 30%
 - Special Education: 25%

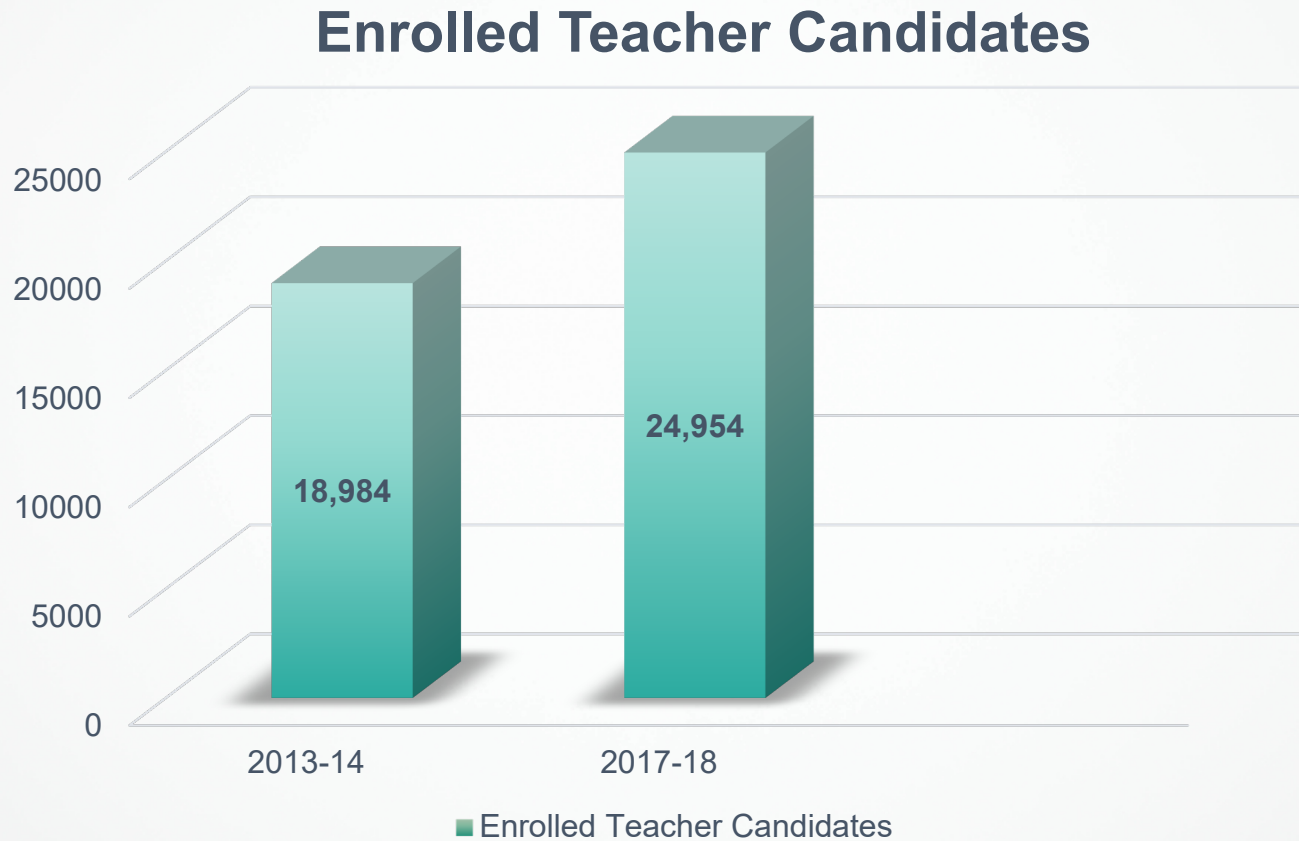
PREPARATION

Table O: Total Enrollment by Teacher Preparation Program Systems, 2017-18

IHE Segment Type	Number of Enrolled candidates	Number of Program Completers	Total Enrolled and Program Completers	Percent of Total
California State University	7,960	6,252	14,212	37.8%
University of California	374	756	1,130	3.0%
Private/Independent College and Universities	15,564	5,153	20,717	55.2%
District Intern/COE	1,056	442	1,498	4.0%
Total	24,954	12,603	37,557	100.0%

Note: Data include program enrollment and program completers in Academic Year 2017-18.

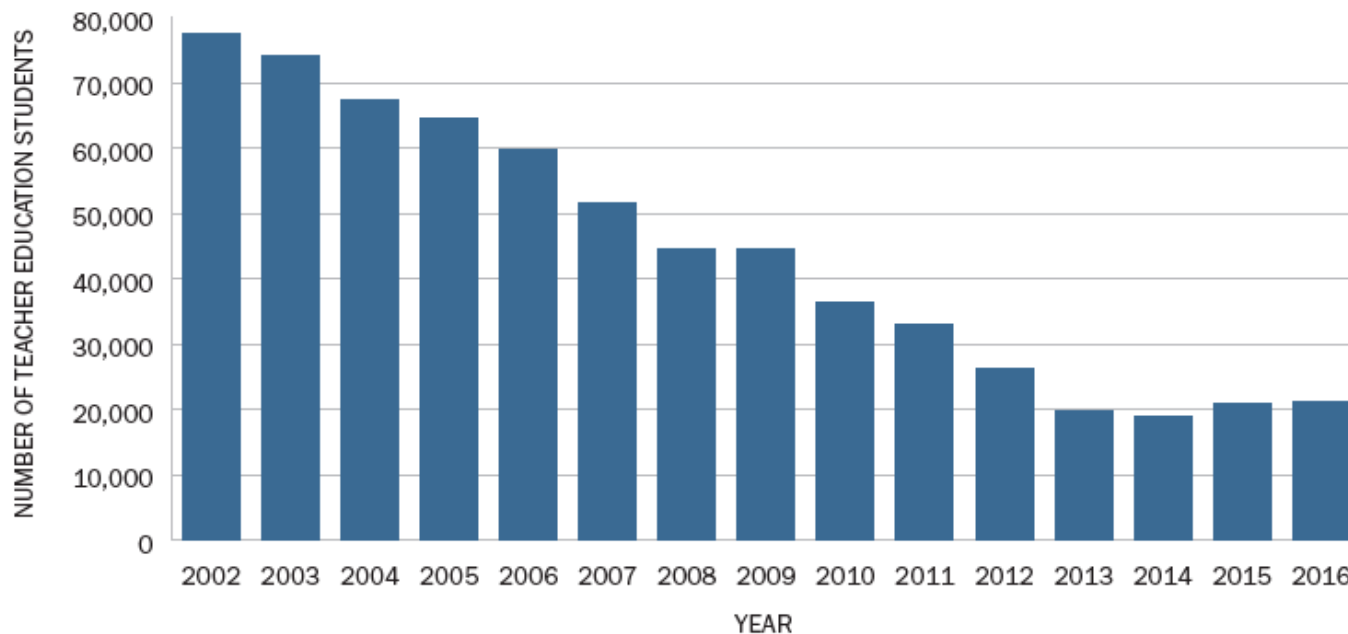
RECENT INCREASE IN TEACHER CANDIDATES



TEACHER CANDIDATES ENROLLED, 2002-16

Enrollment in Teacher Preparation Programs Remains Low

Number of California teacher preparation program enrolled candidates, 2001-02 to 2015-16



Source: California Commission on Teacher Credentialing. Data available at <http://www.ctc.ca.gov/reports/data/titlell-prog-info.html>. Data from 2015-16 was provided by the CTC through a special request.

STEM SPECIFIC

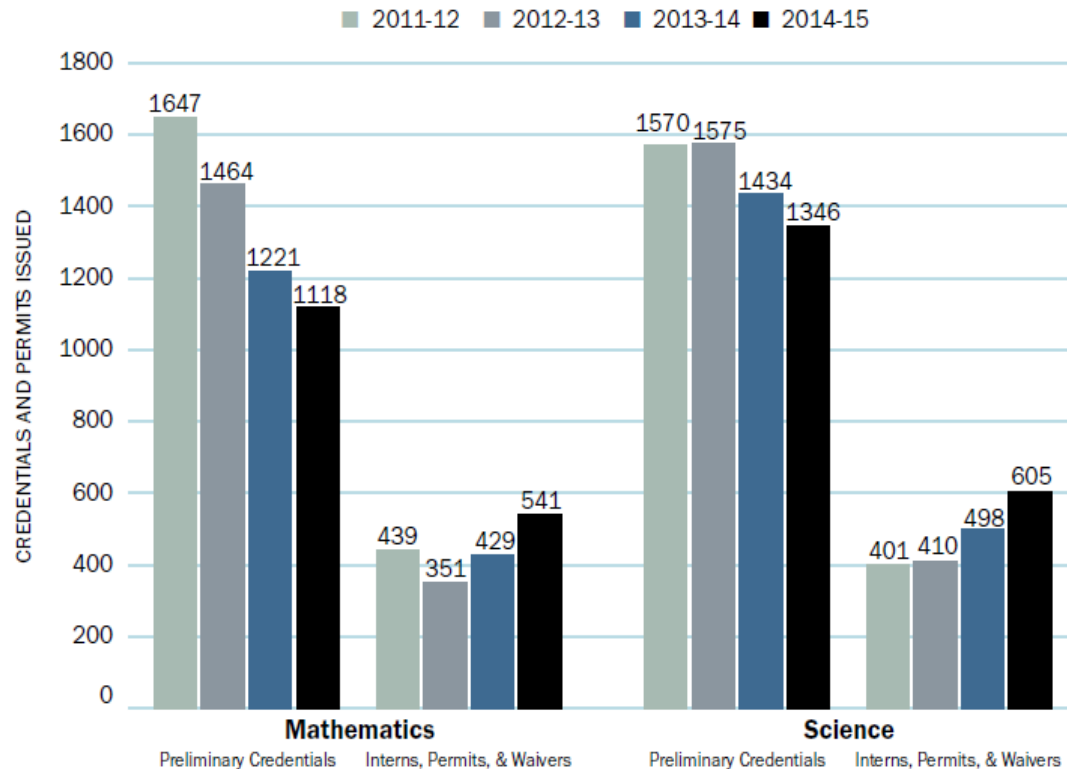
- Education mismatch – STEM majors and teacher preparation programs
- Culture of STEM departments
- UTeach – STEM majors + teacher preparation (UC Berkeley, UC Irvine)

CREDENTIALING

- Ensure teacher quality by upholding consistent standards
- Often cited barriers to credential:
 - Testing
 - Paperwork (out of state, private school)
 - Cost

STEM CREDENTIALS, PERMITS/WAIVERS

Figure 7: **Trends In Mathematics and Science Teacher Supply**



Credentials and permits issued, 2011-12 to 2014-15

Source: California Commission on Teacher Credentialing.

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TESTING

- California Subject Examinations for Teachers (CSET)
- Passage rates are often low have disparate results in STEM areas.

MATHEMATICS (FOUNDATIONAL) 2003-15

- Overall passage rate: **50.5%**
- White: 52%
- Native American: **38%**
- Hispanic American: **43%**
- Asian American: 59%
- African-American: **35.6%**

SCIENCE (FOUNDATIONAL) 2003-17

- Overall passage rate: **58.7%**
- White: 64.5
- Native American: 65.5
- Hispanic American: **42%**
- Asian American: 60%
- African American: **29%**

AB 2485

- Under consideration by Asm. Education Committee
- Allow candidates to waive the CSET through coursework, subject matter program or other subject area examination.

STRATEGIES AND POLICIES

COMPENSATION

SALARIES

- 13 governors have proposed raising teacher pay
- Presidential candidates included in platform
- Statewide solution due to teacher mobility
- ESSA Title II-A high poverty schools
 - Differential pay to meet need

LOAN FORGIVENESS/GRANTS

- Average bachelor's degree holder is \$20,000 in debt (CA)
- Teacher preparation and induction is an additional cost ~ \$15,000
- Assumption Program of Loans for Education (APLE): 1983-2013
- Carolinas >teachers fellows program
 - Scholarship towards BA and credential
 - Four year teaching commitment
 - 70% of graduates are still teaching after 5 years
 - NC program = 10% of all teachers trained in the state, retention rate exceed that of other preparation options.
 - California: Governor's Teaching Fellowship (2000-2004)

ADVANCEMENT PAY

- *We lack teacher career tracks that compete financially with the lure of becoming a school administrator. In most places now, the pathway to higher compensation eventually leads out of the classroom.*
- Ariel Sacks, middle school teacher (EdWeek, 2019)

ADVANCEMENT PAY

- Career ladder models
- Promote mentoring and coaching through incentive pay
- Keeps experienced teachers in the classroom
- Increases the number of mentors for novice teachers
- Rochester, Cincinnati have had long standing programs
- National Board Certification (NBC) recognition

PREPARATION

GROW YOUR OWN PROGRAMS

- **Grow Your Own:** recruit high school or college students or community paraprofessionals to become teachers.
 - Provides support for undergraduate education as well as teacher preparation. Can be general or tailored to need. California Paraprofessional Teacher Training Program: bilingual, SpEd or district identified area of need.
- California Classified School Employee Teacher Credentialing Program (2016-forward)
- Out of state: NC and SC Teacher Cadet Program: offers high school course (with college credit). SC program is over 30 years old; 1 of 5 cadets earn a credential, cost is \$100/student

STEM TEACHER RESIDENCIES

- Residency: Ongoing support for BA/teacher education in exchange for years of service.
 - Additional benefits: mentoring, local need, often more diverse teachers.
- LAUSD – CSU Dominguez Hills (STEM Teacher in Advanced Residency- STAR) – single subject credential plus masters.
- Bakersfield USD – CSU Bakersfield (Elementary STEM)
 - Kern Union- 95% retention rate after 3.5 years
- \$30,000 stipend, plus \$4,000 grant

LOCAL/REGIONAL STRATEGIES

SUPPORTING PROFESSIONAL LEARNING

➤ **Top Reasons Teachers Leave**

- Inadequate Preparation of Novice Teachers
- Lack of Support
- Challenging Working Conditions (e.g. lack principal support, time for teacher collaboration)

➤ Both math and science have newer standards

- Requires deep professional learning-CSBA video
- Support from principals

COLLABORATION WITH TEACHER PREPARATION PROGRAMS

- source of data: who your future teachers are; what do they expect as teachers?
- Faculty may be able to assist LEAs on attrition and recruitment strategies
- College of Ed collaboration with undergraduate math and science department

RETIRED TEACHERS

- Immediate source of labor
- Able to fulfill a mentoring role
- Average age at retirement: 61.5 years
- Earnings cap: \$47,713 [2020-21]
- A contribution model could be revenue neutral.

HIRING

- Timing of hiring
- Weak hiring processes (lack of vetting, enough time for teaching demonstrations)
- Disparities in hiring timing

HIRING TIMELINES

Longer posting periods	Higher vacancies/1000 students
Lower achieving LEAs (~11days longer)	Lower achieving LEAs (12% more)
Urban districts	Rural districts (almost 2x of urban districts)
LEAs further away from a teacher preparation program	Border districts

NOT JUST QUANTITY

- Teacher workforce that supports a diverse student population
- Increased test scores
- Improved graduation rates
- Less chronic absenteeism
- Greater self-esteem

QUESTIONS TO CONSIDER

- Where do your new teachers get prepared?
- What kind of data on teacher attrition is available?
- What is your local CSU/prep program doing to prepare STEM teachers?
- How do you use retired teachers?
- Does your hiring needs reflected in your incentives? (CBA)

LINKS TO MORE RESOURCES

Learning Policy Institute (LPI)

Diversifying the Teaching Profession: How to Recruit and Retain Teachers of Color [Report](#)

The Teacher Residency Model: An Innovative Model for Preparing Teachers [Report](#)

Why Do Teachers Leave? [Infographic](#)

Understaffed and Underprepared: California Districts Report Ongoing Teacher Shortages [Brief](#)

Getting Down to Facts/PACE:

Teacher Staffing Challenges in California: Exploring the Factors that Influence Teacher Staffing and Distribution [report](#)

Teacher Shortages in California: Status, Sources, and Potential Solutions (includes video)

<https://gettingdowntofacts.com/publications/teacher-shortages-california-status-sources-and-potential-solutions>

STEM Residencies: LAUSD – CSU Dominguez Hills www.csudh.edu/csi3/star/

Bakersfield – CSU Bakersfield <https://bit.ly/3e71Rhu>

Kern Rural Teacher Residency <https://bit.ly/2UPHa1T>

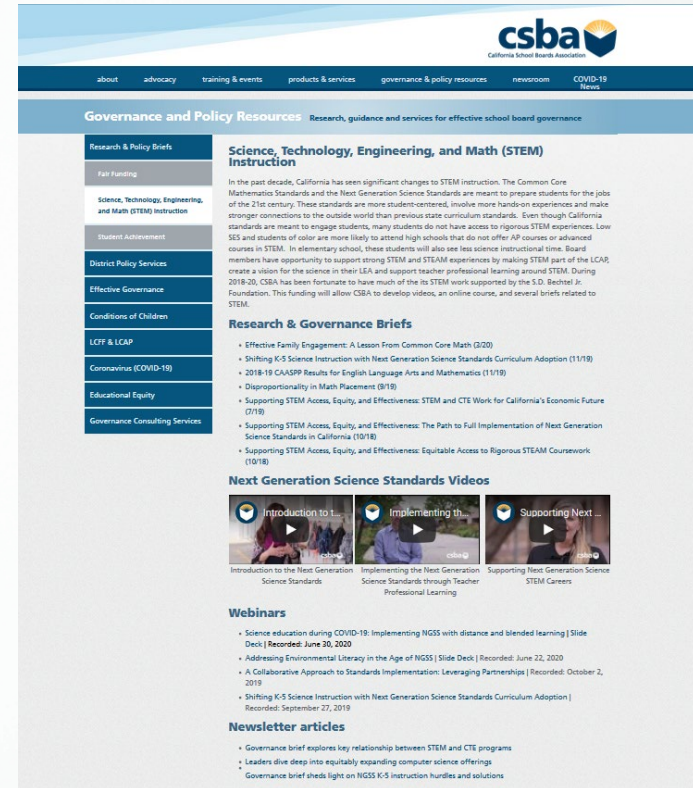


QUESTIONS



THANK YOU TO THE S.D. BECHTEL JR. FOUNDATION

- During 2018-20, CSBA has been fortunate to have much of its STEM work supported by the S.D. Bechtel Jr. Foundation.
- This funding has allowed CSBA to develop videos, an online course, and several briefs related to STEM.



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**What are you
doing in the
middle of
the night?**

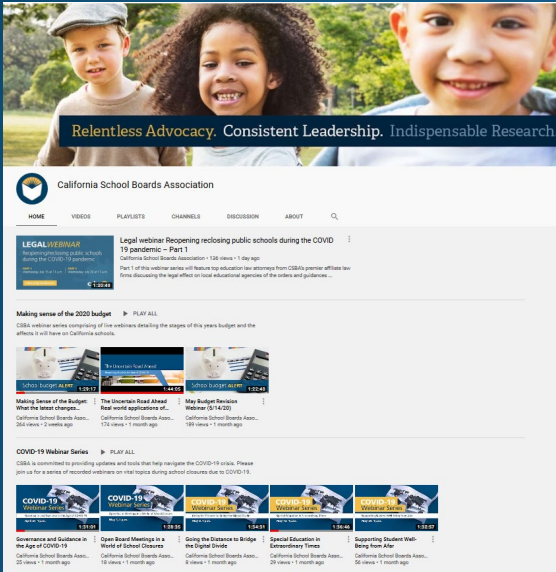
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RESOURCES



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