

## Overview of California’s Approach to Mathematics Instruction

November 2024

California’s approach to mathematics instruction builds on extensive research informing effective mathematics teaching and learning for our diverse student population and incorporates successful approaches used in nations that produce high and equitable achievement in math<sup>1</sup>. This overview outlines California’s comprehensive approach to improving student mathematics achievement, including the state’s standards, curriculum framework, guidance, and recent investments to support implementation.

### California’s Foundational Math Framework

Adopted by the California State Board of Education (SBE) on July 12, 2023, the [2023 Mathematics Framework for California Public Schools \(Mathematics Framework\)](#) guides mathematics instruction in California. The purpose of the *Mathematics Framework* is to support the implementation of the [California Common Core State Standards for Mathematics \(CA CCSSM\)](#). Adopted in 2010 and updated in 2013, the CA CCSSM put forth the state’s expectations for mathematics, kindergarten through grade twelve (K–12), mapping out what students need to know and be able to do in math by the end of each grade or course. For early learners, the [mathematics domain of California’s Preschool/Transitional Kindergarten Learning Foundations](#) is organized to align with the CA CCSSM and describes the mathematical knowledge and skills that most children ages three to five and a half typically develop in high-quality, equitable, and responsive early education programs. The 2023 *Mathematics Framework* provides new guidance on enacting the CA CCSSM through curriculum and instruction that builds on a body of research for producing high achievement in math. Helping students develop the thinking skills and content knowledge necessary to master the standards is critical to improving academic performance and creating conditions for later success. The 2023 *Mathematics Framework* also includes strategies to support educators in cultivating skillful use of California’s [Standards for Mathematical Practice](#) in ways that challenge, engage, and support all students in deep and relevant math content learning.

The 2023 *Mathematics Framework* prompts educators to structure the teaching of the state’s rigorous standards around “Big Ideas” that integrate rather than isolate TK–12 math concepts. This approach encourages teachers to think about how the Big Ideas in mathematics connect both within and across grade levels in developmental progressions. The *Mathematics Framework* also aims to dispel myths around who can and who can’t learn math and encourages development in students of a growth (rather than fixed) mindset, which bolsters perseverance, confidence, and achievement. It includes guidance to help educators make math instruction culturally and personally relevant and empowering. The *Mathematics Framework* describes and illustrates developmentally appropriate pedagogical approaches that increase engagement and achievement for all students, especially those who have been underrepresented in STEM careers. Additionally, the *Mathematics Framework* incorporates explicit guidance for planning assessment and instructional materials adoptions that are

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<sup>1</sup> California Department of Education (CDE). (2023). *California Mathematics Framework: Summary*. <https://www.cde.ca.gov/ci/ma/cf/documents/cmfsummary.docx>

responsive to the needs of multilingual learners (representing 40 percent of California students and a majority of those entering kindergarten).

To align with SBE guidelines and the CA CCSSM, the *Mathematics Framework* affirms two high school pathways—Traditional and Integrated—and clarifies the autonomy of local schools and districts in designing courses and pathways that best meet the needs of local families. The guidance helps educators to integrate and align math concepts taught at the middle and high school levels, ensure that all high school math pathways are open to all students, and expand high school math course options to encourage more students to go beyond [minimum course-taking requirements](#).

### **Instructional Materials and Guidance**

The instructional shifts illustrated in the revised 2023 *Mathematics Framework* create a need for new mathematics instructional materials aligned to the framework’s research and best practices to be adopted. The SBE formally scheduled a mathematics instructional materials adoption for 2025 by approving a formal [notice of intent to hold an adoption](#) and a [schedule of significant events](#) during the January 18, 2024, SBE meeting. The adoption of these instructional materials will consider three types of programs: basic grade level for kindergarten through grade eight, Algebra I, and Integrated Mathematics I. The adoption of the last mathematics instructional materials took place in [2014](#).

State-adopted instructional materials and accompanying implementation resources support local decisions about *Mathematics Framework*-aligned curriculum resources. California *Education Code* sections 60200–60206 describe the [process for the adoption of instructional materials](#) and mandate that submitted materials be evaluated for alignment with the adopted content standards and specific evaluation criteria approved by the SBE. Instructional materials are broadly defined to include textbooks, technology-based materials, other educational materials, and tests.

Local educational agencies (LEAs)—school districts, charter schools, and county offices of education—have the authority and the responsibility to conduct their own evaluation of instructional materials and to adopt the materials that best meet the needs of their students. The SBE updated [Guidance for Local Instructional Materials Adoptions](#) in March of 2024. This document supports local educational agencies (LEAs) throughout the adoption process of instructional materials, including links to current legislation, sample timelines, support for student groups, and implementation considerations.

- At its September 11, 2024, meeting, the SBE approved revised guidance throughout *Section B: Standards Guidance for Mathematics* of California’s [Digital Learning Integration and Standards Guidance](#) (DLISG) document to be in alignment with the recently adopted *Mathematics Framework*. The purpose of the DLISG is to develop a distance learning curriculum and instructional guidance for use when learning is taking place in a distance learning environment, hybrid learning environment, or when educators are using technology for instruction in a face-to-face learning environment.

- The [California Preschool/Transitional Kindergarten Learning Foundations](#) (PTKLF) were recently revised to reflect recent research in child development in all domains, including [mathematics](#). Early education programs can use the PTKLF to select and implement curricula aligned with the PTKLF, guide the selection of assessments aligned with the PTKLF, design and offer professional development and coaching programs for educators to support understanding and effective use of the PTKLF, and enhance preschool to third grade (P–3) continuity across learning goals and practice in mathematics.

### **State Assessment System**

The [California Assessment of Student Performance and Progress \(CAASPP\)](#) evaluates student performance on assessment targets aligned to mathematics standards in grades three through eight plus grade eleven with both [summative tests](#) and a wide range of [interim tests](#) and [formative tools](#) to support ongoing assessment in the classroom. Optional [diagnostic assessments](#) aligned with the Common Core standards in English-language arts and mathematics have been reviewed and recommended by the CDE for use in grade two.

### **Teacher Education**

Whether earning a [multiple-subject credential to teach in an elementary classroom or a single-subject credential to teach secondary mathematics](#) in California, teacher candidates must demonstrate the ability to understand and teach the progression of the state-adopted academic content standards and applicable English Language Development Standards for students in mathematics. Teachers learn to foster positive attitudes toward mathematics, help students develop a growth mindset, and encourage student curiosity, academic discourse, and persistence in solving mathematical problems.

The California Commission on Teaching Credentialing's [Mathematics Instructional Added Authorization and Mathematics Instructional Leadership Specialist Credential Program Standards](#) require programs to adhere to high standards for developing candidates' mathematical content knowledge, specialized mathematical knowledge for teaching and thinking, and pedagogical knowledge and practices for teaching mathematics. Teacher preparation programs provide teacher candidates with opportunities to develop advanced practices in the use of students' mathematical thinking, mathematical representation, mathematical language, mathematics curriculum, instructional planning, classroom discourse, and assessment.

Because mathematics instruction is hampered when teachers enter the classroom before completing preparation, the state has recently invested approximately \$1.3 billion to enable teachers to enter fully prepared. These funds are helping to address shortages: Golden State Teacher Grants, new teacher residency programs, and investments in preparation for classified staff have supported thousands of individuals to become well-prepared teachers.

### **Professional Development**

California's statewide infrastructure to support professional learning and systems improvement includes a network of [county offices of education \(COEs\)](#) that work collaboratively with school

districts to address locally identified needs. [Seven Geographic Lead Agencies](#) support other COEs through the Statewide System of Support by providing resources, expertise, and services to support student success. COEs are developing or leveraging existing regional support networks (like communities of practice) and resources to train educators on the 2023 *Mathematics Framework*. Further, LEAs are permitted to use various funding sources, such as Learning Recovery Emergency Block Grant Funds and Educator Effectiveness Block Grant Funds, to provide professional learning and coaching for educators on the 2023 *Mathematics Framework*.

Additionally, California supports professional learning and training in mathematics instruction aligned to the 2023 *Mathematics Framework* by funding several statewide initiatives:

- The [California Subject Matter Projects](#) provide discipline-specific, research-based, sustained professional learning and leadership programs with the goal of developing teacher subject matter knowledge, pedagogy, and agency. The [California Mathematics Project](#) supports [19 regional sites](#) located at the University of California (UC), California State University (CSU), and independent college and university campuses to provide programs that strengthen teaching and learning in mathematics.
- The [Mathematics Professional Learning Partnership \(MPLP\) Grant](#) was established in 2024 to develop and deliver educator training and resources, primarily focused on the training of mathematics coaches and teacher leaders, designed to support educators throughout the state in providing high-quality K–12 mathematics instruction, aligned to the 2023 *Mathematics Framework*.
- The [Learning Acceleration System Grant](#) (LASG), administered by the [California Collaborative for Educational Excellence](#), provides evidence-based professional education for educators that can support learning acceleration, particularly in mathematics, literacy, and language development. The mathematics components of the LASG are supported through the Rural Math Collaborative and the California Collaborative for Learning Acceleration.
  - The [Rural Math Collaborative](#) provides asynchronous professional development modules on the *Mathematics Framework* and provides ongoing development and coaching through professional learning networks on Framework-aligned mathematics instruction (particularly Lesson Study) and interventions. Currently, modules on Number Sense for grades TK-2 and grades 3-5 are available.
  - The [California Collaborative for Learning Acceleration](#) (CCLA) offers [free, asynchronous learning modules](#), broken up by grade span, to train educators on using Representations, Mathematical Language, and Word Problems to accelerate learning in mathematics. The CCLA also offers [mathematics workshops](#) for California educators and customized professional learning to partner districts.

- The [California Mathematics, Science, and Computer Science Partnership](#) (CAL-MSCS), administered by the San Joaquin COE in partnership with the Santa Barbara and Monterey COEs, was funded in the 2022 Budget Act and is dedicated to building out the statewide professional development infrastructure for teachers in grades 4-12 to ensure access to high-quality training opportunities in math, science, and computer science.
- In 2018, the Office of the Fresno County Superintendent of Schools (FCSS) was selected to lead the [California Statewide Early Math Initiative](#) to create innovative professional development, communications, and resources for early math educators to improve mathematics achievement for early learners. [Count Play Explore](#) is funded through this investment and serves as a statewide, multi-agency effort across California to promote positive and confident math and science outcomes among children from birth to 3rd grade.

### **Universal Pre-Kindergarten**

[Research](#) shows that high-quality preschool leads to [gains in children's mathematical skills](#) development. The state's recent funding increases in childcare and preschool programs, including the Early Educator Teacher Development grant to increase the number of highly-qualified teachers available to serve in the California State Preschool Program (CSPP) and Transitional Kindergarten (TK), in combination with the \$3.7 billion commitment to expand access to universal pre-kindergarten for all 4-year-olds by 2025-26, will support early mathematical skill acquisition.

### **Conclusion**

California has acted with purpose and urgency to bolster each pillar of the intricate support system for mathematics. The 2023 *Mathematics Framework* outlines a vision for mathematics grounded in research and an unwavering commitment to California students. Additionally, California has worked to update universal pre-kindergarten expectations, teacher preparation program standards, and statewide guidance to ensure cohesion and alignment. Finally, the significant investments in professional development for mathematics education outlined above provide various opportunities for LEAs to enhance math instruction locally. In the coming years, California will continue strengthening its system of support to accelerate mathematics achievement.